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Seeking pathways towards improved transboundary environmental governance in contested marine ecosystems

Thesis presented by
Sarah Twomey, BSc, HDip, MA
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University College Cork
College of Arts, Celtic Studies & Social Sciences
Department of Geography

Head of School/Department: Dr. Kieran Hickey
Supervisor: Dr. Valerie Cummins (School of Biological, Earth and Environmental Sciences)
Advisor: Dr. Kieran Hickey (Department of Geography)

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Declaration

This is to certify that the work I am submitting is my own and has not been submitted for another degree, either at University College Cork or elsewhere. All external references and sources are clearly acknowledged and identified within the contents. I have read and understood the regulations of University College Cork concerning plagiarism.

Sarah Twomey

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Abstract

In academic circles, international maritime boundaries have received renewed interest as a consequence of geopolitically charged events. As marine resources become scarcer, transboundary ecosystems that were previously looked upon as peripheral are increasing in importance. Over 200 maritime boundaries are as yet unresolved due largely to conflicting and entrenched legal or political positions or limited political will to break to impasse. Intractable conflicts that occur in these contexts are highly political, long-term, complex, dynamic and extremely resistant to change despite genuine efforts to resolve them. Whilst some borders have a legally common delimited line agreed by adjoining states through an international agreement, they can be fiercely contested by one side despite a formally agreed framework. In other border areas, when ownership of a territory is disputed, the absence of an agreement on ownership and a clearly defined boundary line creates potential for conflict. Examples of both of these scenarios within the marine environment were examined as in-depth case studies in this thesis. This study addressed the complexity associated with resolving conflicts in contested transboundary marine ecosystems and explored whether agreed maritime boundaries are essential, or whether some resource conflicts can be successfully managed through informal arrangements or resource sharing regimes in contested marine ecosystems.

A multi-perspective interdisciplinary meta-analytical framework and timeline mapping technique was applied in two diverse case studies from the Global North and Global South: Lough Foyle separating the Republic of Ireland and Northern Ireland and Palk Bay separating India and Sri Lanka. Primary and secondary data collection included extensive fieldwork in both study sites, desktop research, media content analyses, participatory GIS conflict hot-spot mapping and 67 semi-structured interviews with key informants representing government, industry, the research community and civil society. Trajectory of Change Timelines were developed for both case studies as a tool for the systematic analysis of the protracted conflicts through the identification of parallel historical and geopolitical transformations that have

influenced the status quo. Based on the case study findings, a number of prominent contextual factors and uncertainties that drive resource conflicts in contested regions were identified; (i) the footprint of the past: the legacy of colonialism and arbitrarily drawn boundaries; (ii) coastal border regions: the paradox of spatial proximity to neighbouring States and peripherality from the seats of political power; (iii) strategy or apathy: the consequences of political inaction; (iv) the limitations of LOSC and existing theories of environmental governance; (v) the challenges of moving away from traditional approaches based on political boundaries towards integrated ecosystem-based governance.

Transboundary environmental governance in these settings is inherently a political process, ultimately determined by the broader historical and geopolitical context, and often subject to apathy or strategy by neighbouring coastal states. Resource conflicts arising from contested marine ecosystems pose insights into a level of complexity and uncertainty in real-world scenarios that fail to align with conventional principles or theoretical best practice frameworks. Political leadership is critical in addressing transboundary issues through cooperative approaches with neighbouring jurisdictions. Conceptual or theoretical best practice frameworks for environmental governance are immaterial if political leaders are not willing to come to the table and agree on pathways to break the impasse. The following evidence-based insights for future governance options of contested marine ecosystems were formulated within the context of current geopolitical realities: breaking the political deadlock by re-framing the issue; 'agreeing to agree' by reaching a bilateral agreement supported and implemented by both Governments on a mutually acceptable boundary line; or 'agreeing to disagree' on boundary delimitation but cooperating through a joint development scheme.

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Acronyms

AAG	American Association of Geography
ADR	Alternative Dispute Resolution
AIADMK	All India Anna Dravida Munnetra Kazhagam (Indian political party)
ARIF	Alliance for Release of Innocent Fishermen (India)
ASSI	Area of Special Scientific Interest
BCLME	Benguela Current Large Marine Ecosystem
BIC	British–Irish Council
BIM	Bord Iascaigh Mhara (Republic of Ireland)
BMCG	Bilateral Marine Coordination Group
BOBLME	Bay of Bengal Large Marine Ecosystem
BOBP-IGO	Bay of Bengal Programme Inter-Governmental Organisation (Asia)
CBD	Convention on Biological Diversity
CCCRMD	Coast Conservation and Coastal Resources Management Department (India)
CCRF	Code of Conduct on Responsible Fisheries
CEA	Central Environment Authority (Sri Lanka)
CEFAS	Centre for Environment, Fisheries and Aquaculture Science (Northern Ireland/ United Kingdom)
CICEF	Central Institute for Coastal Engineering and Fisheries (India)
CIFT	Central Institute of Fishing Technology (India)
CITES	Convention on International Trade in Endangered Species
CMFRI	Central Marine Fisheries Institute (India)
CRZ	Coastal Regulation Zone Notification of 1991 and 2011 (India)
DAERA	Dept. of Agriculture, Environment and Rural Affairs (Northern Ireland)
DAFM	Department of Agriculture, Food and the Marine (Republic of Ireland)
DAHDF	Dept. of Animal Husbandry, Dairying and Fishing (India)
DARD	Department of Agriculture and Rural Development (Northern Ireland)
DCC	Donegal County Council (Republic of Ireland)
DCCAE	Dept. of Communications, Climate Action and Environment (Republic of Ireland)
DCSDC	Derry City and Strabane District Council (Northern Ireland)
DFAT	Department of Foreign Affairs and Trade (Republic of Ireland)
DMK	Dravida Munnetra Kazhagam (Indian political party)
DMZ	De-Militarised Zone
DUP	Democratic Unionist Party (Northern Ireland political party)
DWC	Department of Wildlife Conservation (Sri Lanka)
EA	Ecosystem Approach
EBM	Ecosystem-based Management
EEZ	Exclusive Economic Zone
EPA	Environment Protection Act (India)
ESAI	Environmental Science Association of Ireland
EU	European Union
FAO	Food and Agriculture Organisation (of the United Nations)

FCILC	Foyle, Carlingford and Irish Lights Commission (Island of Ireland)
FCDO	Foreign Commonwealth Development Office (United Kingdom)
FFC	Foyle Fisheries Commission (Island of Ireland)
FIMSUL	Fisheries Management for Sustainable Livelihoods (Research project)
FISHMARC	Fisheries Management Resource Centre (India)
FSI	Fisheries Survey of India
GEF	Global Environmental Facility
GFA	The Good Friday Agreement
GOI	Government of Ireland
HOC-NIAC	House of Commons Northern Ireland Affairs Committee
ICES	International Council for the Exploration of the Sea
ICJ	International Court of Justice
IMBL	International Maritime Boundary Line
IREDA	Indian Renewable Energy Development Agency
ITLOS	International Tribunal for the Law of the Sea
IUCN	International Union for Conservation and Nature
IUU	Illegal, unreported, and unregulated fishing activities
JWG	Joint Working Group
KWIC	Key Words in Context
LME	Large Marine Ecosystem
LOSC	Law of the Sea Convention 1982
LTTE	Liberation Tigers of Tamil Eelam (Sri Lanka)
MCA	Media Content Analysis
MEBM	Marine Ecosystem-Based Management
MEPA	Marine Environment Protection Authority (Sri Lanka)
MFARD	Ministry of Fisheries and Aquatic Resources Development (Sri Lanka)
MNRE	Ministry of New and Renewable Energy (India)
MOD	Ministry of Defence (Northern Ireland/UK; Sri Lanka; India)
MOEF	Ministry of Environment and Forests (India)
MOU	Memorandum of Understanding
MPEDA	Marine Products Export Development Authority (India)
MSP	Maritime/ Marine Spatial Planning
NAFSO	National Fisheries Solidarity Movement (Sri Lanka)
NAQA	National Aquaculture Development Authority (Sri Lanka)
NASCO	North Atlantic Salmon Conservation Organisation
NFAB	Fisheries Survey of India, National Fisheries Advisory Board
NFDB	National Fisheries Development Board (India)
NGO	Non-Governmental Organisation
NI	Northern Ireland
NIWE	National Institute of Wind Energy (India)
NPC	Northern Provincial Council (Sri Lanka)
NPWS	National Parks and Wildlife Service (Republic of Ireland)
NRM	Natural Resource Management

NSMC	North South Ministerial Council (Island of Ireland)
OECD	Organisation for Economic Cooperation and Development
PCA	Permanent Court of Arbitration
PR	Public relations
REINCORPFISH	Reincorporating the excluded fisheries sectors (Research project)
ROI	Republic of Ireland
RSPB	Royal Society for Protection of Birds (Northern Ireland/ UK)
RTE	Raidió Teilifís Éireann (Irish Television Broadcaster)
SAC	Special Area of Conservation
SDGs	Sustainable Development Goals
SFPA	Sea Fisheries Protection Authority (Republic of Ireland)
SIFFS	South Indian Federation of Fishermen Societies
SIMCelt	Supporting Implementation of the MSP in the Celtic Seas (Research project)
SMILE	Sustainable Mariculture in Northern Irish Lough Ecosystems (Research project)
SPA	Special Protection Areas
TBCA	Transboundary Conservation Area
TBPA	Transboundary Protected Area
TBPP	Transboundary Peace Park
TDA	Transboundary Diagnostic Analysis
TIMG	Transboundary Integrated Marine Governance
TOCT	Trajectory of Change Timeline
TPEA	Transboundary Planning in the European Atlantic (Research project)
UK	United Kingdom
UNCLOS	United Nations Convention for the Law of the Sea
WLPA	Wild Life Protection Act of 1972 (India)

List of publications

This PhD thesis is predominantly original, unpublished work by the author, Sarah Twomey.

Peer-reviewed publications

Minor parts of this thesis (chapter four, sections 4.1.2; 5.2.1; 5.3) drafted by the author have been published in the following peer-reviewed articles:

> Flannery, W., O'Hagan, A.M., O'Mahony, C., Ritchie, H. and Twomey, S., 2015. Evaluating conditions for transboundary Marine Spatial Planning: Challenges and opportunities on the island of Ireland. Marine Policy, 51, pp.86-95.
>
> Ritchie, H., Flannery, W., O'Hagan, A.M., Twomey, S., O'Mahony, C. 2019. *Marine Spatial Planning, Brexit and the island of Ireland*. Irish Geography Review, 52 (2), 213-233.

Book chapters

Minor parts of this thesis (chapter two, section 2.2) drafted by the author have been published in the following book chapter:

> Twomey, S. and O'Mahony, C. 2019. Stakeholder Processes in Marine Spatial Planning: Ambitions and Realities from the European Atlantic Experience, in Maritime spatial planning: past, present, future (pp. 295-325). Cham, Switzerland: Springer.

Peer-reviewed conference presentations

Parts of this thesis have been orally presented at various scientific conferences during the course of this study:

> Twomey, S., 2015. Exploring the culture of cooperation in Indo-Sri Lankan waters. ENVIRON 2016, the 26th Irish Environmental Researchers' Colloquium, University of Limerick, Ireland.
>
> Twomey, S., 2017. Stakeholder participation in Ecosystem-Based Governance: Lessons from the European Atlantic. American Association of Geographers (AAG) conference, April 6-9,2017. Boston, USA.
>
> Twomey, S, 2017. Stakeholder participation in integrated approaches to transboundary marine governance: Lessons emerging from shared seas in Europe, Asia, and Africa. MARE 2017: People and the Sea conference, July 5-7, 2018. University of Amsterdam, The Netherlands.

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Chapter 1: Introduction

1.0 Introduction

Oceans are ascending in importance. As a result of developments in international law, the rights of coastal states over maritime space have evolved and extended over time such that they now encompass an area comparable to the world's land territory (Schofield, 2012). Yet cartographic illustrations of the political map of the world rarely show boundary lines at sea. In parallel, a major dichotomy exists in terms of Blue Growth, considered by some as an economic agenda based on resource exploitation and wealth creation (Hadjimichael, 2018), and the opposing need to protect and conserve the marine environment. This is leading to more and more contestation.

Globalisation, coupled with unprecedented technological advancements in the last century have opened up remote transboundary regions previously considered too peripheral to invest in. Whilst the demand for seafood protein continues to increase in conjunction with exponential population growth, a third of all global fish stocks are over-fished (Food and Agriculture Organisation (FAO), 2020a). The current and potential future effects of climate change and sea level rise have major implications for marine biodiversity (Pecl et al., 2017; Poloczanska et al., 2013; Doney et al., 2012). As we are entering a new era for maritime politics, the potential for conflict over maritime space and shared marine resources is rising.

As national terrestrial borders have evolved over time, maritime geographies have also experienced dramatic changes. Segregating oceans into zones of national ownership is a relatively recent concept which can be traced back to the Truman Proclamation[1] on 28 September 1945:

[1] Truman (1945). Proclamation 2667—Policy of the United States with Respect to the Natural Resources of the Subsoil and Sea Bed of the Continental Shelf.

'*Having concern for the urgency of conserving and prudently utilizing its natural resources, the Government of the United States regards the natural resources of the subsoil and sea bed of the continental shelf beneath the high seas but contiguous to the coasts of the United States as appertaining to the United States, subject to its jurisdiction and control In cases where the continental shelf extends to the shores of another State, or is shared with an adjacent State, the boundary shall be determined by the United States and the State concerned in accordance with equitable principles. The character as high seas of the waters above the continental shelf and the right to their free and unimpeded navigation are in no way thus affected.*

This was followed by the Santiago Declaration of 1952 when several Latin America States claimed a 200-miles maritime zone (Vicuña, 2004). As a number of states began to assert their sovereignty and legal rights over maritime spaces adjacent or far from their coasts, the need for political consensus for an international legal regime became increasingly critical. Subsequently, different attempts at codification of the customary law of maritime boundary delimitation and various disputes on overlapping maritime boundaries initiated a progressive development of the law of maritime delimitation (Dundua, 2006). The term UNCLOS (United Nations Convention on the Law of the Sea) refers to the three Law of the Sea Conference negotiated in 1958, 1960, and 1982. UNCLOS III was negotiated between 1973 and 1982, opened for signature in 1982 and entered into force on 16 November 1994 upon deposition of the 60th instrument of ratification. LOSC refers specifically to the Law of the Sea Convention- 1982.

International cooperation by states on maritime issues is regarded as fundamental to the maintenance of peace, security, and economic well-being for all the nations of the world (UN, 1994). The legal body of contemporary maritime delimitation is grounded on various sources of law including the customary international law developed during the 19th century, the various Conferences throughout different stages of the 20th century, LOSC, numerous bilateral and multilateral delimitation

agreements and a host of international tribunal decisions stemming from disputes on overlapping titles (Jagota, 1985).

Under LOSC, every coastal state has some jurisdiction over the adjoining oceans and seas, the limits of which are defined by international conventions and national legislation. The Convention carves the seas into explicit zones; the territorial sea, the contiguous zone, the exclusive economic zone (EEZ), the continental shelf, the high sea, the international sea-bed area and archipelagic waters; and specifies the rights and duties of states and ships flying their flags in those zones.

The success of human societies is contingent on the integrity of the living components of natural and managed systems (Pecl et al., 2017) within and across these zones. In recent years, there has been intensifying recognition of the need to address the human dimensions of managing ecosystems (Castillo et al., 2020; Barreto et al., 2020; Weber et al., 2019; Spalding et al., 2017; Christie et al., 2017). The concept of human dimensions is an overarching term to encompass the human and social aspects of ecosystems and involves the analysis of attitudes, perceptions and preferences related to human uses and compliance (or lack of compliance) with natural resource management rules (Barreto et al., 2020; Gonzalez-Bernat et al., 2019). In research terms, this entails a focus on the governance of the social, economic, cultural, political, and institutional aspects inherent in marine resource governance (Barreto et al., 2020; Gray and Purdy, 2018).

Environmental governance refers to a wide spectrum of rules and processes whereby different stakeholders work together to mitigate environmental issues at different scales through the creation of optimal conditions for formal and informal institutions and mechanisms for decision-making (Rodela and Swartling, 2019; Bennett and Satterfield, 2018; Warner and Marsden, 2012; Lockwood, 2010). Good governance is crucial when dealing with escalating pressures on the marine environment (Smythe, 2017; van Tatenhove, 2013; Lockwood et al., 2010; 2009; Graham et al., 2003) including resource conflict between stakeholders. Governance sets the stage within which the management of natural resources occurs (Olsen, 2003) and can shape or

alleviate conflict between stakeholders (Tuda et al., 2020; O'Lear and Diehl, 2011; Pomeroy and Douvere, 2008; Hemmati et al., 2002).

The Ecosystem Approach (EA) has emerged as the prevailing theoretical and policy framework underpinning contemporary approaches to marine governance processes primarily in the Global North (e.g. Douvere and Ehler, 2009) and increasingly in the Global South (e.g. de Barros Netto et al., 2016). Practical applications of the EA framework include integrated tool such as Marine Ecosystem-Based Management (MEBM) and Marine (or Maritime) Spatial Planning (MSP). These approaches to marine resource management are characterised by strategic, place-based, participatory, governance processes that actively engage stakeholders to address unique challenges and conflicts that exist especially in intensely used marine ecosystems (Jay et al., 2016; Roxburgh et al., 2012; Kidd et al., 2011).

Coastal and marine ecosystems are amongst the most challenging ecosystems to manage. 'The difficulty stems from the complexity of marine populations, the dynamics of linked social-ecological systems, and the scale issues related to jurisdictional boundaries and organisations' (Chuenpagdee 2011: 197). Interactions within marine ecosystems 'create certain levels of complexity and dynamics that are difficult to comprehend and to steer' (Chuenpagdee 2011: 200). Hammer (2015) argued that natural resource management of marine ecosystems is challenged by a lack of knowledge, inadequate governance institutions and traditional management approaches that are not tailored to cope with the processes and dynamics of complex marine socio-ecological regional seas in Europe.

International borders are designed to protect the sovereignty of land, sea, natural resources, and human populations (Mackelworth et al., 2013). However, political borders are rarely drawn up with regard to the integrity of ecosystems (Hanks, 2003; Blake, 2002). Over the past century, more natural resources have become transboundary resources because of radical geopolitical transformations (Benvenisti, 2002) largely associated with the demise of colonial powers. The independence of the former imperial peripheries has been synonymous with epoch-making changes

based on cultural identity and a redefinition of sovereignty that imposes on states new responsibilities to their citizens (Zhurzhenko, 2016). Of the 193 sovereign states currently recognised by the United Nations (UN), 128 have emerged since 1945 (O'Dowd and McCall, 2008; Griggs and Hocknell, 2002). Some of the more recent transformations include the collapse of the Soviet empire, the subsequent expansion of the European Union (EU) and the implications of the UK leaving the European Union (Brexit), for Europe and the island of Ireland. In parallel to these terrestrial changes, 'as natural resources become scarcer, transboundary marine regions which were previously considered peripheral are increasing in importance' (Mackelworth et al., 2013: 112).

International collaboration between with states adjoining transboundary marine ecosystems is a prerequisite for the effective governance and sustainable management of shared resources (Petersen-Perlman et al., 2017; Mackelworth, 2016a; Bavinck et al., 2014b; Levin et al., 2013; Reed and Bruyneel, 2010; Wolf, 2003). According to Levin et al. (2013), a combination of natural factors and human-induced pressures make international collaboration necessary including; the high mobility of many species such as straddling fish stocks (Song et al. 2017; Scholtens and Bavinck, 2014), the common use of marine resources (Ostrom, 1999; 1990; Hardin, 1968), transboundary movement of pollutants (Vinogradov, 2007; Hills and Roberts, 2001) and varying degrees of marine sovereignty associated with LOSC zones (Suarez de Vivero et al., 2009).

Stakeholders represent a host of marine activities operating in our seas covering diverse statutory, regulatory, commercial, and societal perspectives. They are the gatekeepers to a vast amount of experience, knowledge, values and interests and increasingly play a pivotal role in contemporary marine governance (Twomey and O'Mahony, 2019; Fidelman et al., 2014; Olsen et al., 2014; Gopnik et al., 2012; Ritchie and Ellis, 2010; Pomeroy and Douvere, 2008). Marine governance in a transboundary context involves stakeholders from these different sectors across a range of scales from international, to regional, national, and local levels from two or more countries (Warner and Marsden, 2016). The degree of involvement of these stakeholders

depends upon how conducive the existing governance arrangements are for their participation which is ultimately influenced by a range of political, legal, socio-economic, and cultural contextual factors (Twomey and O'Mahony, 2019).

1.1 Significance of the problem

In academic circles, international borders, both terrestrial and maritime, have received renewed interest as a consequence of geopolitically charged events. The politics of managing stakeholder activities and marine resources that straddle two or more jurisdictions has emerged as a contentious theme across the globe (Hasan and Jian, 2019; Guo, 2018; Hasan et al., 2018; Bavinck et al., 2017; Warner and Marsden, 2016; Forbes, 2003; 2001). In terms of global outreach of this problem, maritime boundary disputes are present in all continents. A recent study reports that less than half of the 427 potential maritime boundaries have been resolved to-date and many of these only partially, covering part of the length of the potential maritime boundary or dealing with only continental shelf rights rather than the EEZ (Ásgeirsdóttir and Steinwand, 2015).

Disputes in the maritime sphere tend to ebb and flow and can range from 'active and conflictual' to 'dormant and cooperative' (Byers and Østhagen, 2019: 164). According to Binder (2017), maritime boundary disputes are often more complex than those at land. Minghi (1963) argued that terrestrial borders generally tend to directly affect two states that it separates, whereas a maritime boundary can affect many more states as it denotes the limits of a state's sovereignty into the high seas. A feature of many, if not the majority of boundary disputes is their longevity (Cannon, 2019). One of the most well-known examples from the global South is the longstanding territorial dispute between six coastal nations over the Spratlys and Parcels islands in the South China Sea (Nappen, 2019; Petallides, 2016; Forbes, 2015).

Shared ecosystems are more likely to be contested when it involves a geo-strategic location, environmental resources of high economic value or a shared cultural or linguistic group (Hensel et al., 2000). The absence of an agreement on a clearly defined boundary line creates potential for conflict. A maritime boundary dispute can

prevent economic exploitation of offshore oil and gas (Byers and Østhagen, 2019; Schofield, 2014) or renewable resources such as offshore wind energy (Borthwick, 2016; Flannery et al., 2015) and impede the management of transboundary fish stocks (Zhang, 2018; Dang, 2012). Cooperative approaches are essential in defining national maritime limits in contested regions but also in developing governance solutions to sustainably co-manage marine resources that transcend political boundaries. Cooperation within these contexts can be expressed on a graded continuum (e.g. from non-cooperation to full cooperation with joint planning) (Sandwith et al., 2001; Zbicz, 1999a; 1999b). Above all, settling a maritime boundary dispute requires political willingness by both parties to compromise.

The transboundary nature of shared marine spaces, however, increases the complexity of their management and even more so, when they are contested. Geopolitics and historical (or current) conflict can further hinder cooperative action across borders. Under LOSC (Article 123), states with enclosed or semi-enclosed seas are obliged to cooperate in managing shared living resources and coordinating protection of the marine environment and scientific research. In contested regions, this obligation is particularly difficult to achieve. With over half all maritime boundaries unresolved, limited attention has been paid to these contested marine ecosystems (from an environmental governance perspective) as a distinctive site for the study of the challenges and opportunities for transboundary environmental governance.

1.2 Theoretical basis for the study

This section synthesises and presents a brief overview of the most relevant theoretical perspectives and associated analytical frameworks that have helped conceptualise the study across different fields of inquiry. A comprehensive critical analysis of these perspectives is presented in Chapter two.

Qualitative research related to the human dimensions of socio-ecological systems and related interdisciplinary efforts to tackle complex sustainability challenges is becoming increasingly popular (Alexander et al., 2019; Macura et al., 2019; Jones et

al., 2018; Bennett et al., 2017; Mace, 2014; Hicks et al., 2010). Although the field of marine resource governance is often viewed through the lens of natural sciences, the premise of this research is that the application of social science perspectives, specifically from the fields of geography, geopolitics, border studies, and conflict analysis and resolution, are paramount to the development of successful approaches in transboundary marine environmental governance. Without employing a broad spectrum of approaches and methods, important contextual factors may be obscured and inadequate contextual understandings can potentially result in politically and culturally inappropriate governance strategies (Bennett et al., 2017; Bennett, 2016; Corson and MacDonald, 2012).

The principles of good environmental governance are well documented; transparency, participation, accountability and adaptability (Bennett and Satterfield, 2018; van Putten et al., 2018; Shearing et al., 2013; Wingqvist et al., 2012; Lockwood, 2010; Lockwood et al. 2010, 2009; Heldeweg, 2005; Graham et al., 2003). It is recognised that in the field of environmental governance, scientists do not have all the answers (Rodela and Swartling, 2019). Theoretical approaches to combat complex environmental problems have become increasing pervasive in the collaborative governance literature (Bodin, 2017; Plummer et al., 2013; Armitage and Plummer, 2012; Plummer and Armitage, 2010; Gunningham, 2009). Collaborative (or participatory governance) originate from Olson's Theory of Collective Action (for common pool resource governance) and represents an umbrella terms for the collective action of stakeholders across boundaries (i.e. generally in organisations or sectors) in a formal, consensus-oriented, and deliberative process of decision-making in planning, policy making, and management (Gray and Purdy, 2016; Holley, 2016; Emerson et al., 2012; Holley and Gunningham, 2011; Ansell & Gash, 2008; Head et al., 2005; Gray, 1989).

A considerable body of knowledge specific to collaborative environmental governance has emerged in recent decades (Newig et al., 2018; Bodin, 2017; Holley, 2016; Bodin et al., 2016; Scott, 2015; Emerson and Nabatchi, 2015). Theories of collaborative environmental governance claim that this approach has the capacity to

reduce conflict, increase cooperation and contribute to a deeper understanding and capacity to address 'wicked' transboundary problems (Camacho, 2020; Holley and Gunningham, 2011; Wondolleck and Yaffee, 2000). A problem is considered wicked, when it is difficult to define and delineate from other and bigger problems (Hisschemöller and Gupta, 1999). It has been argued that aspects of fisheries governance can be considered wicked, as the associated problems are never solved once and for all but pose a constant challenge (Jentoft and Chuenpagdee, 2009).

Perhaps most significantly from the perspective of this thesis, the collaborative environmental governance literature proposes a shift from a system of exclusive territorial sovereignty, characterised by politically defined jurisdictional boundaries, towards transboundary collaborative governance processes (Holley, 2016). Prominent examples applied in both the Global North and Global South are the regional seas transboundary collaborative efforts under the EU's Maritime Spatial Planning Directive (Twomey and O'Mahony, 2019; Jay et al., 2016; Jay, 2015; Flannery et al., 2015; Almodovar et al., 2014; Backer, 2011); and the transition towards MEBM in the Benguela Current Large Marine Ecosystem in Africa (Hamukuaya et al., 2016, de Barros et al., 2016; Cochrane et al., 2009; O'Toole, 2009).

Governance of complex socio-ecological systems requires ongoing monitoring and assessment to improve their effectiveness (Chuenpagdee and Jentoft, 2009). Chuenpagdee and Jentoft (2013) developed a governability assessment framework for analysing issues, challenges and concerns in fisheries and aquaculture. They argue that factors enabling and constraining the governability of marine resources typically originate from the interactions between the socio-ecological system-to-be governed and the existing governance system (e.g. where governance decisions are made through institutions, formal and informal rules etc.). This framework provides a comprehensive governability lens for examining conflicts involving resources that are central to this thesis. Recognising the fundamental differences between these systems is vital when developing governance strategies (Karlsson and Gilek, 2019).

Actions taken by one country can negatively influence the quality and availability of natural resources in neighbouring jurisdictions, with implications for the people

within their boundaries (Schulze, 2012). In order to overcome the challenges associated with governing shared resources, the following characteristics of successful common pool resource governance have been documented: authorised use and common boundaries are defined; congruence exists between the environment and the governance structures; decision are made collectively through stakeholder participation; rules are enforced through effective monitoring; violations are penalised by graduated sanctions; accessible and affordable conflict resolution mechanism are in place; the rule-making rights of the participation are respected by external authorities and rules are embedded and enforced within a multi-layered nested framework (Ostrom, 1999; 1995; 1990).

However, despite an extensive body of environmental governance literature, there is no panacea for transitioning from good principle to effective governance Furthermore, resource conflicts in contested marine ecosystems pose insights to a level of complexity, in real-world scenarios, that fail to fit into neat conceptual or theoretical best practice frameworks. For this reason, theoretical concepts from other fields of inquiry have been incorporated into the research design to better inform future approaches to governance in contested ecosystems.

Contemporary theories and methods in border studies are drawn from a variety of disciplinary concerns with multi-dimensional perspectives (Wilson and Donnan, 2012) and have irrefutably undergone a radical transformation since its geographical beginnings. According to O'Dowd (2010), the field of border studies has been traditionally over-influenced by the cartographic representations of borders which fail to capture the significance of the historical and geopolitical process that led to their establishment.

Geopolitics can be defined as the struggle over the control of geographical entities with an international and global dimension, and the use of such geographical entities for political advantage (Flint, 2016). In recent decades, discourse in the field of geopolitics has shifted to questions of *how* and *why* boundaries have and continue to be created (Van Houtum and Berg, 2018; Dalby, 2008; Ó Tuathail et al., 2006; van Houtum, 2005; Dijkink, 1998; Ó Tuathail, 1996). Through this lens, borders are

portrayed as ‘troublemakers’ of human creation, permanently open to question, and represent a legacy of a past dominant discourse whereby separating territory and people was widely accepted (Agnew, 2008; 1994).

Contemporary approaches in the field of conflict analysis and resolution emphasise constructive methods to resolving them. The structured analysis of conflicts can bring awareness of what events in the past and the present shaped them (Lederach, 1996). CAR requires tracing the interconnectedness of conflicts (Dahrendorf, 1959) and assessing the multiplicity of stakeholders (Crocker et al. 2005; Touval and Zartman, 2001) in order to develop solutions which can yield mutual gains for all (Kriesberg and Neu, 2018). A fundamental concept is that conflict should be analysed through a series of stages: emergence, escalation, de-escalation and settlement, and sustaining peace (Ramsbotham et al., 2011; Kriesberg, 2007). The concept of understanding conflict within its unique context is critical to this thesis and is shared by many natural resource management conflict theorists (e.g. Sidaway, 2013; Yasmi et al., 2006; Castro and Nielson, 2001; Daniels and Walker, 2001; Warner, 2000; Buckles and Rusnak, 1999; Walker and Daniels, 1997).

In summary, in order to adequately address the context-specific governance challenges unique to contested marine ecosystem, research must take a broader inter-disciplinary perspective. An understanding of borders is essential to the study of transboundary areas. In addition, an appreciation of the historical geopolitical relations of the regions and the nature and root causes of resource conflict were critical in the research. The theoretical framing for this multi-dimensional study is thus rooted in the theory of interactive governance, collective action for common pool resources governance as applied in the fields of environmental governance, border studies, critical geopolitics and conflict analysis and resolution.

1.3 Problem Statement

As marine resources become scarcer, transboundary ecosystems that were previously looked upon as peripheral are increasing in importance (Mackelworth et

al., 2013). Sustainable ecosystems require a more integrative systems perspective that transcends political boundaries (Bodin et al., 2014). However, history has demonstrated that socio-political boundaries are intrinsic to the human psyche and act to demarcate the spatial limits of sovereignty, ownership, and decision-making (Dallimer and Strange, 2015). However, human-determined boundaries, regardless of whether they are agreed or contested by neighbouring jurisdictions, rarely align with the ecological limits of ecosystems. The greater the number of coastal states sharing an ecosystem, the more complex the legal situation and resulting administrative system may be, leading to more potential conflict between marine stakeholders. In addition, the socio-political and economic interactions between neighbouring countries can have major implications for transboundary environmental governance decisions and outcomes (Levin et al., 2018).

Multiple constraints and barriers to integrated ecosystem-based marine governance exist in shared ecosystems. The effective management of socio-ecological systems often requires stakeholders representing different sectoral interests to change their behaviour (St. John et al., 2014). Existing EA tools such as MEBM and MSP (discussed in further detailed in chapter two) have arguably been designed to deal with spatial and temporal conflict between stakeholders within one jurisdiction. Transboundary approaches in MEBM and MSP are in a relatively nascent stage with research-based initiatives currently underway at different scales in the EU (SIMAtlantic)[2], Africa (MARISMA)[3], and Asia (BOBLME)[4]. Application of these types of EA approaches in contested regions will invariably be even more problematic.

Whether a shared marine ecosystem has always been disputed or contested after a boundary has been formally agreed, the maritime border in question rarely aligns with ecological boundaries. An absence of bilateral cooperation can lead to a political

[2]SIMAtlantic is a transboundary MSP project in the European Atlantic involving partners from the Ireland, the UK, France, Spain and Portugal http://www.simcelt.eu/

[3] MARISMA is a Marine Spatial Management and Governance project involving partners from Angola, Namibia and South Africa promoting sustainable ocean use of the Benguela Current Large Marine Ecosystem. https://www.benguelacc.org/index.php/en/marisma

[4]The Bay of Bengal Large Marine Ecosystem (BOBLME) project involving Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka, and Thailand is improving regional management of the Bay of Bengal environment and its fisheries. https://www.boblme.org/

impasse (or vice versa), which in turn can trigger or re-ignite dormant resource conflict between stakeholders across the shared ecosystem. When geopolitics come into play, settlement on a maritime boundary or cooperation regarding shared resources becomes arguably more than a legal or technical matter. The fundamental procedural principle of general application forming part of the International Court Justice's doctrine, and as indicated in 1982 LOS Convention, is the principle of effecting maritime boundary delimitation by agreement. The principle constitutes a special application of the general principle of peaceful settlement of international disputes and puts emphasis on a state obligation to negotiate in good faith with a view to conclude agreement.

Some of the major impacts associated with contested maritime boundaries include reduced biological diversity and environmental degradation linked to pollution (Li et al., 2017; Mora et al., 2016, Dorman et al., 2016; Hoogweg and Colijn, 1992); over-exploitation of natural resources (Guo, 2018; Mackelworth et al., 2016b; Forbes, 2001), and illegal, unreported and unregulated (IUU) fishing activities (Menon et al., 2016; Scholtens and Bavinck, 2014; Yoon, 2015; Gupta and Sharma, 2008).

There are different approaches to be employed for the delimitation of each maritime zones (and discussed in further detail in Section 2.3.1). LOSC Articles 74 and 83 deal with delimitation of the EEZ and the continental shelf respectively. Delimitation of these zones contain specific provisions in relation to the settlement of disputes by peaceful means and if necessary, compulsory procedures entailing binding decision. Within the context of territorial seas (which is significant for this thesis), in the absence of an agreement on the delimitation of this particular maritime zone, coastal states with opposite or adjacent coasts may not 'extend their territorial seas beyond the median line' (LOSC, Article 15). As a result, in keeping with the wider principles of equitable solutions and just outcomes that are fundamental to the spirit of LOSC, the median line approach tends to be used in these scenarios. Unlike delimitation in the EEZ or continental shelf, there are no explicit provisions for the settlement of disputes through compulsory procedures entailing binding decisions. Although drawing a line halfway between two contesting states can sometimes be the most

straightforward way, this is not necessarily the reality in all territorial sea as is the case in the study sites presented in chapter four and five.

The complexity of maritime borders has largely been described in the marine governance literature (see Tafon, 2018; Jay et al. 2016; Kidd and Shaw, 2013; Agardy et al., 2011, Backer, 2011); however, gaps exist particularly for those marine ecosystems with arbitrary borders contested by neighbouring jurisdictions. This thesis proposes that insufficient attention has been afforded to the historical context and geopolitical processes which underpin the construction of contested maritime borders and the resource conflicts that emerge because of protracted ambiguity. The diversity of stakeholders and scale of complexity inherent in these distinctive settings therefore calls for a contextualised approach. Given the challenges inherent in transboundary marine areas, can transboundary marine governance mechanisms be adapted to the unique geopolitical realities to ameliorate resource conflict? Can these mechanisms involve the active participation of stakeholders from government, industry, and civil society from both jurisdictions?

1.4 Research questions and objectives

Based on the key issues outlined in the problem statement, the primary aims of this thesis were to better understand contested transboundary marine issues and explore whether agreed maritime boundaries are essential, or whether some resource conflicts can be successfully managed through informal arrangements or resource sharing regimes in contested marine ecosystems.

The over-arching research question in this thesis asks:

If, and under what circumstances, can good environmental governance arrangements for transboundary resources be achieved in contested marine ecosystems?

In addition, in order to answer this high-level question, the following sub-questions also guided the research process:

a. *What are the prominent contextual factors and uncertainties that drive resource conflict in contested regions?*
b. *How can we move towards ecosystem-based approaches and away from reductionist thinking of these areas in terms of lines on maps?*

Based on the research questions, the core objectives for the overall study were to:

1. Develop a multi-perspective interdisciplinary framework to critically analyse resource conflicts in contested marine ecosystems.
2. Establish a multi-perspective baseline of information on resource conflicts stemming from case studies of contested marine ecosystems.
3. Identify key issues from current practices via insights from the case study analysis to understand the complexity and uncertainties around geopolitical realities affecting marine governance in these contexts.

1.5 Introducing the case studies

Whilst some borders have a legally common delimited line agreed by adjoining states through an international agreement, they can be fiercely contested by one side despite a formally agreed framework. In other border areas, when ownership of a territory is disputed, the absence of an agreement on a clearly defined boundary line creates potential for conflict. Examples of both scenarios within the marine environment are examined as in-depth case studies in this thesis.

In terms of geographical scope, as this is an international issue; this investigation adopts a comparative case-study approach spanning the Global-North and Global South and address issues relating to declining marine resources and increasing demands for protein. Both study sites specifically deal with resources within territorial seas and the implications of that maritime jurisdictional zone for approach taken to delimitation (or not). The case studies were selected as a means to achieve the broader study objectives by applying the analytical framework to: (i) establish a multi-perspective baseline of information on the resource conflict, (ii) critically analyse the interplay between the existing governance arrangements, historical legacy, geopolitical transformations and the current resource conflict from diverse

perspectives, in order to (iii) re-frame the resource conflict and (iv) formulate empirically-based insights for future governance options set within the context of current geopolitical realities.

In spite of geographical and developmental differences, Lough Foyle, a border bay separating two jurisdictions on the island of Ireland in north-west Europe and Palk Bay, a semi-enclosed sea separating India and Sri Lanka in South Asia, are comparable and can be analysed in a similar manner. As key sites of past British colonial rule and geopolitics, these contested regions have struggled with recent armed ethno-national conflicts exacerbated by the legacy of arbitrarily drawn boundaries (Coakley and O'Dowd, 2007; Kumar, 1997). In addition, both are currently experiencing resource conflict and environmental issues because of IUU fishing and unregulated, unlicensed aquaculture activities linked to their protracted contested boundaries.

The success or failure of governance responses to resource conflict often depend on complex decision-making made by policy makers, resource managers and industry (Young, 2017). Effective marine resource governance can benefit from a comprehensive understanding of how and why certain decisions are made. The case-oriented research design enabled an in-depth investigation and comparative analysis of the gaps in existing governance frameworks in order to develop contextualised recommendations specific to contested ecosystems. A range of methods were used to collect primary and secondary data for each of the case studies. This included desktop analysis for systematic reviews of relevant current literature (both academic and grey literature); media content analyses, a combined total of 67 semi-structured interviews with key informants (i.e. experts on the topic) representing government, industry, the research community and civil society; and participatory mapping as a tool for visual communication of resource conflict hotspots during the interviews.

1.5.1 Lough Foyle: Ireland and Northern Ireland

The Republic of Ireland and Northern Ireland are two jurisdictions on the island of Ireland in north-west Europe. Ireland is a sovereign state comprising over 80% of the island and Northern Ireland is a devolved administration of the United Kingdom.

These jurisdictions are separated by two border bays, where the terrestrial borders become maritime. Lough Foyle is located in the north-west, and Carlingford Lough to the south-east. The case of Lough Foyle exemplifies a region whereby an official terrestrial border has been in place for almost a century but as yet, no formal agreement has been achieved on the delineation of their international maritime boundary lines due to a longstanding ownership dispute (IMBL). At present, Northern Ireland is the only part of the United Kingdom (UK) to share a land border with another EU Member State. Despite a series of high-level political discussions over several decades, agreement on the ownership of the border bays has been elusive. Ownership of Lough Foyle and its wider catchment area remain highly contested between stakeholders in both jurisdictions.

In the last century, various conflicts that hinge on issues of natural resource ownership and seabed rights have surfaced and intensified in the Foyle region, for a number of socio-economic and political reasons (Campbell, 2017). The rapid expansion of unregulated and unlicensed oyster trestles is the most current resource conflict and a legacy of the long-term ownership dispute (Ritchie et al., 2019). The case of the contested Lough Foyle ecosystem is an important one because of its longevity (extending from 1922 to-date); its unquestionable linkages with the wider polarised perspectives on territory on the island of Ireland (marked by diverging values and opposing jurisdictional claims), a violent armed-conflict, commonly referred to as 'The Troubles' that led to over 3,600 deaths; and its unique geopolitical location on a peripheral island in north-western Europe (Byrne, 1998).

This research is particularly timely within the context of current geopolitical realities. In the 2016 Brexit referendum on EU membership, Northern Ireland voted to keep the UK in the EU. As the only part of the UK which shares a terrestrial border with another EU country, concerns have been raised about how this border could be affected by Brexit. Following Brexit, the unresolved maritime boundary in Lough Foyle will assume a new geopolitical significance. It will no longer just be a disputed socio-political boundary; it will be elevated to the status of a frontier between an EU and a non-EU territory, an unprecedented situation on the island. This new

geopolitical reality has grave and uncertain implications for marine governance not just in Lough Foyle but also for the entire island of Ireland.

1.5.2 Palk Bay: India and Sri Lanka

Conflicts involving access to fisheries resources are particularly prevalent in South Asia where much of the coastal population rely on their seas for food security and employment (Bavinck et al., 2014; Murshed-e-Jahan et al., 2014; Ahmed, 2006). Marine capture fisheries sectors in this region are often challenged by the paradox of subsistence, small-scale, and intensive industrialised practices striving to coexist in the same geo-social canvas (Government of India, 2012). Palk Bay is a contentious strait and semi-enclosed sea located within the wider Bay of Bengal ecosystem. It is home to the shared marine resources of south India and the north-west coast of Sri Lanka with intense hotspots of conflict relating to IUU fishing by Indian trawlers in Sri Lankan waters. Despite a common cultural heritage and a history of cooperation, the shared ecosystem is now characterised by over-exploitation and environmental degradation.

Between 1983 and 2009, up to 100,000 people died in Sri Lanka's civil war government forces and the Liberation Tigers of Tamil Eelam (LTTE), a rebel group commonly known as the Tamil Tigers, based in the north of the country. Since the war and even today, a fleet of trawlers from Tamil Nadu has continually transgressed Sri Lankan territorial waters that are home to a small-scale fleet, resulting in high numbers of arrests and boat detainments by the Sri Lankan navy for IUU fishing (Scholtens, 2016a; 2016b). Over 100 fishers have also allegedly been killed by the Navy over recent decades (Zacharia, 2015). In particular, the end of the civil war in Sri Lanka in 2009 marked a turning point in the fisheries conflict as Sri Lankan fishermen from the north returned to fishing, increasing pressure on an already vulnerable resource.

This case study is significant in that it explores a complex conflict at sea involving a shared ecosystem separated by an agreed IMBL between the Indian and Sri Lankan

governments. However, the legitimacy of this political border is embedded in domestic politics and fiercely contested by Tamil Nadu, India's most southerly state and Sri Lanka's closest neighbour. Palk Bay exemplifies how strong competition in a spatially limited shared marine resource, asymmetry and inequality, and political resistance can shape the effectiveness of governance responses in ecosystems that transcend political borders.

Through a detailed case study analysis and comparison of two resource conflicts in different contested marine ecosystems, this research contributes to growing field of transboundary marine governance theoretically. It also presents empirical data and insights from key informants (i.e. experts in their field) representing government, industry, civil society NGOs and the research community.

1.6 Structure of the thesis

The thesis takes the following structure: Chapter one presents a general introduction to the core topic, a synopsis of the theoretical basis for the study, a problem statement, and a preview of the case studies. Chapter two provides an overview and discussion of the key concepts and definitions that apply to the marine environment. This is followed by a comprehensive critique of peer-reviewed literature from various fields pertinent to transboundary marine governance. This chapter provides a critical evaluation of the existing knowledge base in terms of the gaps addressed by this research and an overview of the conceptual framework designed to bridge these gaps. The research approach and methodology are described in chapter three. The conceptual framework is applied in chapter four (Lough Foyle case study) and chapter five (Palk Bay case study). The results of the empirical case studies are critically analysed and evidence-based key insights specific to each study site are presented. Based on the findings from the preceding chapters, chapter six presents a comparative case study analysis and detailed discussion of the findings within the context of the research approach and methods. Chapter seven is a concluding chapter that summarises the key issues identified in earlier chapters. It reaffirms the need for pragmatic approaches to improve transboundary governance in contested

marine ecosystems and highlights the overall implications of the findings for theory and conceptual development as well as policy issues. The thesis concludes with a discussion of the transferability and limitations of the study, and the implications for future research.

Chapter 2: Inter-disciplinary literature review

2.1 Introduction

This chapter serves as a theoretical foundation for the thesis by outlining the research approach and scholarly contribution considering a critical evaluation of relevant literature. By focusing on what has already been published in different fields of inquiry, this chapter provides a critical overview of the diverse bodies of literature related to the issue of resource conflict in complex socio-political marine ecosystems.

In terms of structure, the chapter begins with a discussion of the key concepts, terminology and definitions underpinning various themes and theories linked to the research topic. This is followed by a critical review of the existing literature related to the human dimensions of contested marine ecosystems. Selected theoretical arguments from geopolitics and borders studies and geopolitics, conflict analysis and resolution, and environmental governance and management are described and analysed. Conclusions are drawn about the relevance of each field introduced by different literature to formulate a rigorous research agenda incorporating concepts and debates from a range of key disciplinary perspectives. The chapter concludes with a summary of the most relevant literature that informed the methodology, an overview of the research gap identified, and the conceptual framework developed to address this gap. The conceptual framework meets the first research objective: *develop a multi-level interdisciplinary framework to critically analyse governance arrangements in contested marine ecosystems.*

2.2 Key concepts and definitions

The global political map has never been static for too long. The last century has been dominated by a process of rapid transformation as former colonies gained independence, previous states disintegrated, and new states emerged (Blake, 2002). The delineation of international boundaries has geopolitical, economic, and environmental implications for adjoining jurisdictions. In the maritime sphere, the extent of the challenges and the degree of success associated with any attempt to establish a political division vary according to a range of factors. These include the

geopolitical realities of the region, the potential wealth of the marine resource above and below the seabed, and the availability of technology to exploit the resources (Forbes, 2001). As a result, it's not surprising that to-date, only around half of the total potential maritime boundaries have to some extent been agreed (Cannon, 2019; Newman, 2018; Ásgeirsdóttir and Steinwand, 2015; Prescott and Schofield, 2004).

The critical starting point for this chapter is to emphasise that the concept of a human-made border is not a natural phenomenon; they cannot operate or endure without intervention and only exist to the extent that they are deemed meaningful (Terrier, 2014; Diener and Hagan, 2012). Nature and the environment, on the other hand, know no borders. Thus, the environmental challenges encountered by neighbouring jurisdictions in transboundary ecosystems is fundamentally a human-made problem, a consequence of imposing imaginary political lines within one single ecological unit.

Borders are polysemic in nature (Balibar, 2002) and can mean different things to different people. The terms borders and boundaries are often used interchangeably. In the context of this thesis, a 'border' denotes an international boundary defined as a line on a map separating two sovereign states. The boundary line signifies the extent and limits of jurisdictional powers and the allocation of natural resources (Forbes, 2001). According to Nail (2014), the common thread for all borders is that they introduce a division or bifurcation of some sort into the world. Borders can have many direct and indirect functions, they can 'simultaneously enable or disable, separate and connect, serve as barriers and bridges, distinguish between us and others and facilitate or hinder various types of communication' (O'Dowd, 2010: 1035).

Classic political geographers define boundaries as physical barriers that are demarked by legal, institutional, and social processes. It is these borders that tend to delineate the limits of decision-making processes. However, geopolitical boundaries differ from ethnic or cultural boundaries, and neither coincides with ecological

boundaries of an ecosystem (Vörösmarty et al., 2010). Geopolitical entities are therefore critical when it comes to decision-making around how boundaries are implemented and managed (Paasi, 2005) and this has profound implications especially for ecosystems that straddle international borders.

When a maritime boundary is to be drawn between states, the critical question is always invariably political; 'who gets what, when and how'? (Laswell, 1936). 'On land, a fence or markers will give a physical indication of a boundary, but such demarcation is hardly possible at sea' (Walker, 2015: 1). The maritime domain has historically proven less disposed to conflict than the terrestrial. This can be attributed to several variables such as the challenges associated with accessing and using marine space compared to that of land. Another key distinction, as codified in international law (I.e. LOSC), is that the rights states have acquired regarding the ocean, do not correspond to those that states hold in respect of terrestrial territory.

Maritime boundaries, like land boundaries, are politically sensitive subjects (Jagota, 1985). Nevertheless, the maritime domain is often conceptualised as the antithesis and inherently different from terrestrial boundary disputes (Østhagen, 2019; Huth, 2009; Hensel et al., 2008). A significant body of the literature by the most cited authors in the field of conflict and territory (e.g. Carter, 2017; 2010; Carter and Goemans, 2011; Huth et al., 2011; Huth, 2009; Kahler and Walter, 2006; Frazier, 2006) have disregarded the maritime sphere or the conflict associated with maritime territory (Østhagen, 2019). Those authors that have tackled the maritime domain argue that the main driver for agreeing a boundary is to reduce legal uncertainty that prevents exploitation of marine resources, particularly hydrocarbons or fisheries (Ásgeirsdóttir, and Steinwand, 2015; Nyman 2015; Prescott and Schofield, 2004). However, as indicated in the previous chapter, less than half of all maritime boundary disputes have been settled either bilaterally or through court proceedings (Østhagen, 2019; 34; Newman, 2018; Ásgeirsdóttir, and Steinwand, 2016; Prescott and Schofield, 2004).

Despite these large numbers of maritime disputes, two specific case studies have received increasing international attention in recent years. In the Arctic Ocean, the dramatic environmental changes resulting from global climate change has re-ignited an interest in its over-lapping claims (between the United States, Russia, Canada, Norway, and Denmark) as receding seas give rise to new sea routes (Østhagen, 2018; Byers and Østhagen, 2017; Byers, 2013; Hoel, 2009). Likewise, South China Sea, conflict related to power relations and the growing importance of marine resources in the face of scarcity in the broader region, has escalated between China, Vietnam, the Philippines, Brunei, Taiwan and Malaysia (Rothwell and Letts, 2019; Ong, 2015; Hitoshi and Rothwell, 2014; Rothwell, 2013).

Whilst some boundaries have a legally common delimited line agreed by adjoining states through an international agreement, they can be fiercely contested by one side after the demarcation process. In other border areas, when issues of sovereignty and ownership of a maritime territory evolve into a protracted dispute, the absence of an agreement on a clearly defined boundary line creates potential for conflict. Examples of both scenarios within the marine environment are examined as in-depth case studies in this thesis.

There is no single, generally accepted definition for the term 'transboundary'. In social sciences, it is defined in many ways and invariably in relation to interaction or cooperation across a territory or region (Zyikov and Sevastianov, 2015). Within the field of political geography, boundaries signify borders between independent states, and something is described as transboundary if it traverses an integrated territorial system (i.e. a region) (Ganzei, 2010). For the purpose of this thesis, a transboundary region or a cross-border area refers to a geographical system divided by man-made boundaries and governed by different political rules (Guo, 2018).

The term transboundary has only recently come into regular use within the context of environmental governance and more specifically in ecosystem-based management (EBM) strategies that transcend national borders. From this perspective, the term represents the movement of physical and biological resources

or of impacts associated with these resources, across (defined or undefined) political boundaries. Transboundary EBM of natural resources can be defined as a formal process of cooperation across international borders that facilitates the shared ownership and management of natural resources emanating from a single ecological unit or ecosystem (Warner and Marsden, 2016; Holley, 2016; Campbell and Hanich, 2015; Linde et al., 2002).

Geography is knowledge and reasoning applied to the complexities of the world through the lens of place, space, and scale (National Research Council, 2000). Space matters (Lefebvre, 1991) and interactions between people always occur in specific places, locations and situations (Scholte, 2002). Geography is thus a defining feature of social processes involving borders. Geographical territory, including its physical features, is an essential feature of geopolitics and border studies. Geopolitics considers the strategic value of geographic space on land and at sea in the context of national political, economic, and military power in the past, present and future. It has been defined as a branch of geography that examines the relationship between geographical realities and international relations, with a particular emphasis on state competition and the geographical dimensions of power (O' Tuathail and Dalby, 2006; Toal, 1998).

Although the term '*geopolitik*' (geopolitics) was coined by Rudolf Kjellen, the German geographer Friedrich Ratzel is considered the original founder of geopolitics almost a century ago (Ratzel and Oberhummer, 1923). His concept of '*Lebensraum'* (living space) was hugely influenced by Darwin's theories of the origin of species and refers to a specific amount of territory which a group, race, state, or nation believes is fundamentally essential for its natural development (Bassin, 1987; Smith, 1980.) In essence, Ratzel's theory is interlinked with imperialism through the practice of physical and political expansion and the incorporation of foreign societies to ensure the vitality of the state (Bassin, 1987). Following World War II and undoubtedly related to the extreme role played by the Nazi state, there was reluctance amongst scholars to debate Ratzel's theories on geopolitics and territorial expansion.

However, in recent decades, the use of the term geopolitics has received renewed interest in academia and also in mass media as an adjective to describe developments in regions, for example a 'geopolitical issue' or a 'geopolitical question'. In this thesis, geopolitics describes a power struggle between states over a specific territory, its natural resources and the interrelated historical narratives they deem most accurate and the representations they have of their distant or recent past and their distant or near future (Lacoste, 2012). The scope of this definition aligns well with the range of themes investigated in the subsequent chapters.

Globalisation has become a prominent topic throughout the social sciences since the early 1980s (Dreher et al., 2008). It is now widely accepted that we live in a 'global village' and our world is becoming increasingly smaller, with populations that are more mobile and interconnected (Soni, 2019; Da Costa and Attias, 2018; Chatterji and Gangopadhyay, 2017; Martens et al., 2010; Ganster and Lorey, 2004; Rennen and Martens, 2003). From this perspective, the concept of borders has become ambiguous and less meaningful. A vast amount of definitions have been proposed and globalisation has been described as a range of approaches including; 'internationalisation', characterised by unprecedented growth in international exchange and interdependence (e.g. Hirst and Thompson, 1999); and 'liberalisation' whereby governments remove restrictions on movement between countries as is the case in EU Member States (e.g. Morrison et al., 1991); 'westernisation' or modernisation, a process of colonialism which consists of the spread of capitalism and industrialism across the globe and eroding pre-existing local cultures (Petras and Veltmeyer, 2001).

Scholte (2008) regards globalisation as a reconfiguration of geography through the re-spatialisation of social relations. In this way, people have become more able to engage with each other physically, legally, linguistically, culturally, and psychologically. Contemporary globalisation has been characterised by a process of supraterritoriality (Scholte, 2002). This view contrasts with the other more traditional conceptions of globalisation concept and resonates with this thesis in that

'supraterritorial relations are social connections that transcend geography' (Scholte, 2002: 17) and international borders.

The phrases 'Global North' and 'Global South' stem from the field of sociology and describe global difference through the lens of social progress. Broadly speaking, the Global South refers to the regions of Asia, Africa and Latin America outside Europe and North America (i.e. the Global North) which are politically marginalised. Since the end of the Cold War, the use of these terms has become common in academia, particularly in political science, international relations, and development studies. The shift in focus from the 'Third World' to the Global South signifies an emphasis on geopolitical relations of power from development or cultural difference. It references a legacy of colonialism, and differential economic and social change symbolised by large inequalities (Dados and Connell, 2012). This world view provides an alternative to the concept of globalisation.

The use of the term 'conflict' can often be ambiguous and tends to have different meanings in different regions of the world. In this thesis, conflict can be viewed as an umbrella term to describe a continuum of patterns of interactions between individuals and groups. It can range from conflicting interests and values, to short-term confrontations (without violence) and political deadlock, to sustained acts of violence between diverse ethnic or socio-political groups (Ratner et al., 2017). From the perspective of transboundary marine resources, the concept of conflict from the Global South typically involves confrontations between groups or categories of stakeholders regarding a resource activity and its management (Bavinck, 2017). Conflict characterised by confrontations differ from that of conflicting interests between sectors which have been the focus of a significant body of empirical research on coastal and marine governance particularly from the Global North (Schupp et al., 2019; Arbo, 2016; Stepanova, 2015; Stepanova and Bruckmieir, 2013). Conflicting interests do not necessarily escalate to scenarios of confrontations or political deadlock unlike those presented in the case studies which do escalate.

A dispute is a form of conflict which involves a specific disagreement concerning an event or law or policy in which a claim by one party to the dispute is met with a counter-claim or denial by the opposing party (Forbes, 2001). An international territorial or boundary dispute is a disagreement stemming from conflicting claims about ownership or delineation of a boundary between two territories (Guo, 2018). When a territory is disputed, at least one government refutes the definition of where the international boundary line with the neighbouring state is currently located, whereas the other government asserts that the existing boundary line is the legal border based on a previous formal agreement (Huth, 1998). This form of conflict is inevitable in geopolitical relations especially when the territory is home to valuable natural resources. Disputes are therefore a common feature in human relations and the unenviable predicament is how they can be resolved.

The key resource conflicts investigated in this thesis fall under the broad category of Illegal, unreported, and unregulated (IUU) fishing activities. Specifically, the proliferation of unregulated and unlicensed aquaculture (i.e. oyster farms) is the current day resource conflict in the Lough Foyle case study and IUU fishing incursions by an extensive fleet of Indian trawlers in Sri Lankan waters in the Palk Bay case study. The term 'IUU' encompasses a wide range of issues, activities (see Soyer et al., 2018; Hosch, 2016; Agnew et al., 2009; Swan, 2006) and other species including wild-caught marine finfish and shellfish.

IUU fishing is a global issue (Sumaila et al., 2020; Petrossian, 2015; Agnew et al., 2009; 2008; Pramod et al., 2008) that can result in the collapse of a fishery and seriously damage strategies to rebuild stocks that have already been over exploited (FAO, 2020a; 2020b). It remains one of the highest threats to marine ecosystems due to its compelling capacity to undermine national and regional efforts to manage fisheries sustainably (FAO, 2016). IUU activities debilitate the ability of coastal countries to conserve marine biodiversity and achieve the Sustainable Development Goals (SDGs) of the United Nations that the world has agreed upon (Sumaila et al., 2020). In addition, particularly in the Global South, IUU activities can put food security and regional stability at risk (Soyer et al., 2018).

From a South Asian perspective, efforts to combat IUU fishing are integral to ensuring the food security and well-being of coastal communities, where small-scale fisheries constitute 50 to 80 percent of the marine capture fisheries sector (FAO, 2020a). A range of organisations and initiatives support activities to combat IUU fishing, among them the Regional Plan of Action to Promote Responsible Fishing Practices including IUU fishing; the Southeast Asian Fisheries Development Center; the Association of Southeast Asian Nations Guidelines for Preventing the Entry of Fish and Fishery Products from IUU Fishing Activities into the Supply Chain; the Asia-Pacific Economic Cooperation and regional fisheries management organizations in the region (Western and Central Pacific Fisheries Commission, South Pacific Regional Fisheries Management Organisation, NPFO, Indian Ocean Tuna Commission, Southern Indian Ocean Fisheries Agreement, Commission for the Conservation of Southern Bluefin Tina). The FAO has provided support to countries in the region through its Global Capacity Development Programme to support the implementation of the Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (PSMA) and complementary international instruments to combat IUU fishing (discussed further in Section 5.3). This programme provides a range of capacity-development activities to strengthen recipient countries' legal and policy frameworks, institutional set-up, and monitoring, control, surveillance and enforcement systems (FAO, 2020b: 1-2).

From a Global North (European) perspective, in addition to PSMA and other international instruments (discussed further in Section 4.3), IUU activities are unequivocally defined by EU legislation[5] within the context of the following parameters (only):

1. *'**illegal, unreported and unregulated fishing' or 'IUU fishing' means fishing activities which are illegal, unreported or unregulate**d;*
2. *'**illegal fishing'** means fishing activities:*

[5] Council Regulation (EC) No 1005/2008 of 29 September 2008 establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing

(a) conducted by national or foreign fishing vessels in maritime waters under the jurisdiction of a State, without the permission of that State, or in contravention of its laws and regulations;

(b) conducted by fishing vessels flying the flag of States that are contracting parties to a relevant regional fisheries management organisation, but which operate in contravention of the conservation and management measures adopted by that organisation and by which those States are bound, or of relevant provisions of the applicable international law; or

(c) conducted by fishing vessels in violation of national laws or international obligations, including those undertaken by cooperating States to a relevant regional fisheries management organisation;

3. *'**unreported fishing'** means fishing activities:*

(a) which have not been reported, or have been misreported, to the relevant national authority, in contravention of national laws and regulations; or

(b) which have been undertaken in the area of competence of a relevant regional fisheries management organisation and have not been reported, or have been misreported, in contravention of the reporting procedures of that organisation;

4. *'**unregulated fishing'** means fishing activities:*

(a) conducted in the area of application of a relevant regional fisheries management organisation by fishing vessels without nationality, by fishing vessels flying the flag of a State not party to that organisation or by any other fishing entity, in a manner that is not consistent with or contravenes the conservation and management measures of that organisation; or

(b) conducted in areas or for fish stocks in relation to which there are no applicable conservation or management measures by fishing vessels in a manner that is not consistent with State responsibilities for the conservation of living marine resources under international law.

In addition, a validated catch certificate containing information demonstrating the legality of the products concerned is required as a precondition for the import of fishery products[6] into the EU and exports from the EU (Article 12). In theory, the requirement for a catch certificate validated by the country of origin has implications for the export of fish by India from its Palk Bay trawler fleet. In the case of Lough Foyle, oysters are listed as a product excluded from the definition of fisheries products and thus beyond the scope of the IUU regulation and the catch certificate scheme.

Governance is a common theme in political science, international relations, and public sector management (Van Kersbergen & Van Waarden, 2004). Reviews of relevant literature conclude that both the term and concept of governance are amorphous and ubiquitous (Bevir, 2011; Stoker 1998; Rhodes 1996). In this thesis, coastal and marine governance broadly refers to the formal and informal arrangements, institutions (Olsen et al., 2009) that influence *who* makes decisions and *how* environmental decisions are made in environmental planning and management (Bennett et al., 2019; Rodela and Swartling, 2019 Bennett & Satterfield, 2018). The terms 'governance' and 'management' are not synonymous. Governance sets the stage within which management occurs (Olsen 2003) and management approaches thus reflect the prevailing governance arrangements (e.g. fragmentary and weak versus robust and inclusive) (Ritchie et al., 2019).

Environmental governance is a subdivision of the broader governance literature targeting the interactions and dynamics between societies and the environment (Armitage et al., 2012). Different models of governance reflect norms and assumptions about how society should be organised, how problems should be tackled, and by whom (Glasbergen 1998). Theories on governance tend to focus on

[6] ANNEX I List of products excluded from the definition of 'fishery products' set out in point 8 of Article 2 of Council Regulation (EC) No 1005/2008 — Freshwater fishery products — Aquaculture products obtained from fry or larvae — Ornamental fish — Oysters, live — Scallops including queen scallops, of the genera *Pecten, Chlamys or Placopecten*, live, fresh or chilled — *Coquilles St Jacques (Pecten maximus*), frozen — Other scallops, fresh or chilled — Mussels — Snails, others than those obtained from the sea — Prepared and preserved molluscs.

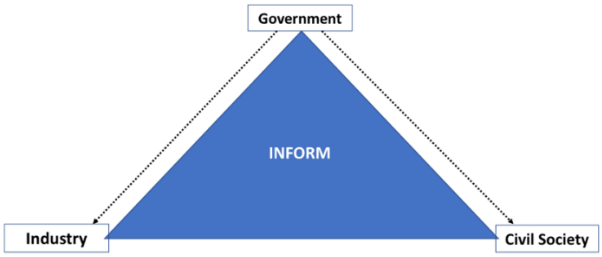
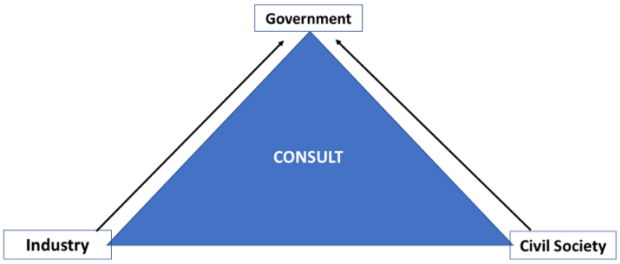
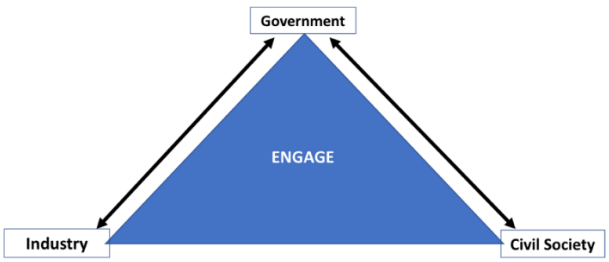
concepts such as 'top-down' (i.e. government-led), 'bottom-up' (i.e. stakeholder-led/community-led), or 'co-management' (a blend of top-down and bottom up) approaches (Jones et al., 2019). Used in the context of transboundary ecosystems and resources, governance refers to a 'wide spectrum of regulatory processes both formal and informal, which seek to assess, mitigate and compensate for the transboundary impacts of particular human activities on the natural environment (Warner and Marsden, 2016: 3).

In recent decades, the term 'stakeholder' has become widely used in the field of environmental governance and particularly in the marine and maritime sphere. Multiple distinctions relating to the term 'stakeholder' can be found throughout relevant literature (see Jay et al. 2016; Flannery et al., 2015; Jay, 2015; Long, 2012; Roxburgh et al., 2012; Pomeroy and Douvere 2008;). Definitions are not consistently used and can mean numerous things in different management and regulatory contexts (Long, 2012). In this thesis, a stakeholder refers to any individual, group or organisation that is or will be affected (either positively or negatively) by governance decisions and can be classified into the following broad domains (adapted from Twomey et al., 2019):

1. Government decision-makers at various levels, statutory bodies, and regulators (i.e. government stakeholders including ministries, state agencies, municipalities and local government; military and maritime security organisations such as the naval service, coast guard etc.).
2. Industry stakeholders representing the key marine sectors operating in the area (e.g. fisheries, aquaculture, oil and gas, renewable energy, transport, ports, tourism, and recreation
3. Research community and academia.
4. Civil-society stakeholders represented by the citizen and community-based organisations, non-governmental organisations (NGOs), and conservation groups.

Participation, engagement and consultation are regularly used interchangeably to signify a process by which individuals and groups (i.e. stakeholders) converge to

communicate, interact, exchange information, provide input or share in decision-making (Twomey and O'Mahony, 2019; Reed, 2008). Although these words are often used synonymously in policy documents and academic literature, they have different meanings. Participation can mean many things to different people. It is frequently used as an umbrella term to describe activities ranging from information provision, public consultation, discussions with the public, or stakeholder collaborations or partnerships as demonstrated in Figure 2.1. It is important to consider that the scope and extent of stakeholder participation differs greatly across regions and from country to country. The level of involvement will also largely depend on the political or legal requirements for participation that already exist in a country or region (Twomey and O'Mahony, 2019).

Informing	Communicating information and raising awareness with industry and civil society stakeholders with no avenue for receiving feedback	 One-way process/ Top-down
Public Consultation	Providing feedback to government decision-makers on potential decisions and alternatives through a formal statutory process.	 One-way process/ Top-down
Stakeholder Participation	Working directly with government throughout the process (and especially before the consultation phase) to ensure that stakeholder concerns and aspirations are understood and considered in	 Two- way dialogue/ Top-down

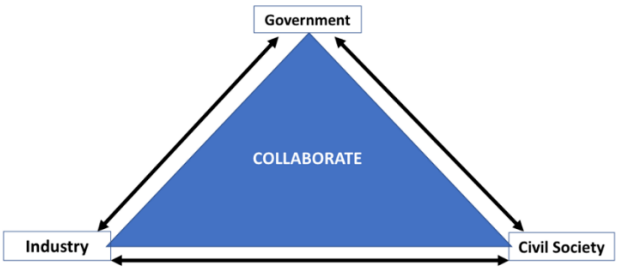
	decision-making processes.	
Stakeholder Collaboration	Partnering with government in each aspect of the decision-making process including the development of alternatives and the identification of the preferred solution (Blend of top-down and bottom-up)	 Multi-sector dialogue/ Blend of Top-down and Bottom-up

Figure 2.1: The continuum of stakeholder participation in environmental decision-making approaches: using the categories of industry, civil society (inc. the research community for the purpose of this model) and government – the latter can include different levels of authority from local, regional to national) with various stages ranging from information provision to collaboration between all categories of stakeholders. The arrows represent the flow of information and the direction of interactions between stakeholders (Adapted from Twomey and O'Mahony; 299 based on Arnstein, 1969).

2.3 Discourses of geopolitics and borders

> *The history of mankind is largely a history of wars, and the goal of most of these wars was the changing of borders (Kolosov, 2015:33).*

Since the 19th century, the concept of boundaries has been a central tenet of political geography and political science. According to De Vorsey and Biger (1995), the majority of contemporary political boundaries were originally created or (at some stage in their evolution were) influenced by European colonial powers. The steady decline of the British Empire and wider decolonisation since World War II, coupled with the fall of the Iron Curtain and the Berlin Wall in 1989 signalled the end of the 'post-second-World-War bipolar system' (Balázs et al., 2014).

These major geopolitical events had profound effects not only on global world order; they also dramatically changed the number and location of borders throughout the Global North and Global South. This proliferation of borders and the multifaceted forces that have enabled their development, extension or demise have attracted

scholars from a range of fields within the humanities and social sciences (Newman, 2006a; 2006b). The field of border studies is therefore extremely broad, and no single theory exists (Kolosov and Scott, 2013). Sevastianov et al. (2015) provided a useful historical overview of the ways in which border studies have evolved.

Early scholars of political geography perceived borders simply as practical lines on a map which served an essential purpose by providing clarity for political and military activities (Minghi, 1963; Prescott, 1965). Political geographers and political scientists viewed borders as 'fixed, stable empirical entities, which divide the global space into bounded units that change mainly as a consequence of conflicts' (Paasi, 1998: 69). The primary focus of these theoretical discourses was the question of *where* the border was located and *what* the political consequences of this location were.

Van Houtum (2005) argued that early theories of borders were primarily influenced by the specific historical context of that time (only 15 years after the end of the World War II and the demise of the Empire) and the profound geopolitical change experienced as a result across the globe. According to Minghi (1963) Before the 1950s, borders were generally viewed as being favourable or unfavourable from a geostrategic military point of view. Subsequently, this view evolved in line with the post-war context and borders began to be considered 'good' if they were natural (e.g. seas, rivers, and mountains) or 'bad' if they were artificial and man-made.

According to O'Dowd (2009), the field of border studies had been traditionally over-influenced by the cartographic representations of borders which fail to capture the significance of the historical and geopolitical process that led to its establishment. The collapse of the East-West divide at the beginning of the 1990s instigated a renewed and divergent interest in political boundaries (Paasi, 2005). Contemporary borders and boundaries are now considered as both social phenomena and a philosophical concept or metaphor (Kolosov and Scott, 2013). Current theories and methods in border studies are thus drawn from a variety of disciplinary concerns with multi-dimensional perspectives (Wilson and Donnan, 2012) and have irrefutably undergone a radical transformation since its geographical beginnings.

Agnew (2008) called for a re-framing of border theories to acknowledge that lines on maps are inherently problematic with practical merits and shortcomings that must be systematically reconsidered. He emphasised the practical implications borders pose (e.g. limits to movement of people and goods) for neighbouring populations and in addition to their psychological effect because they 'trap thinking about and acting in the world in territorial terms' and limit political will (Agnew, 2008: 176). Similarly, Ferdoush (2018) notes that as a territorial framework, states can enable or disable various forms of actions through the introduction of political borders. Borders can thus serve multiple purposes enabling political, economic, or social functions. In parallel, borders are based on the nationalisation of interest (Sahlins, 1989) which is disabling for outsiders dividing territory, resources, and people from one another (Agnew, 2008).

In the field of critical geopolitics, the discourse on boundaries has shifted from questions of where and when influenced by Ratzel's Theory to *how* and *why* they have and continue to be created (Dalby, 2008; Ó Tuathail and Dalby, 2006; van Houtum, 2005; Dijkink, 1998; Ó Tuathail, 1996). Through this lens, borders are portrayed as 'troublemakers' of human creation, perpetually open to question, and represent a legacy of a past dominant discourse whereby separating territory and people was widely accepted (Agnew, 2008).

From a sociological perspective, the ambivalence of border life is considered a defining feature of border societies (Strassoldo, 1982). These local populations can exhibit ambiguous identities as a result of economic, cultural, and linguistic factors pulling them in two directions. Wilson and Donnan (2012) argued that this fluid border identity can affect the role played by border communities in international cooperation and conflict. This unique cultural characteristic of borders is critical when analysing the human dimensions of resource conflicts in transboundary ecosystems and developing pragmatic strategies to address governance challenges.

Important insights on the multifaceted nature of borders can also be drawn from the field of social anthropology. Wallman's (1978) work on social boundaries and the

systematic relations between people and place offer an alternative and innovative view on the relevance and usefulness of political boundaries in contemporary society. She asks:

> '*what kind of resource is this boundary? What is it used for? In which contexts is it relevant? What is it status in historical or situational time? For whom is it an asset, for whom a liability? With what other differences is it congruent or associated? What meaning does it have on the other outer-side?*' (Wallman, 1978: 208).

These questions provide a functional approach to analyse the significance of the border from multiple perspectives on either side.

Linked to Wallman's (1978) research, Van Houtum (2005) focused on the moral consequences of human-made borders and questions 'why we continue to produce and re-produce borders. His theoretical position opposes Ratzel's Theory of territorial expansions and asks ''to what extent is it morally just to protect ourselves' and in doing so 'deny the liberty of access to others' (Van Houtum, 2005; 678). From this perspective, ultimately there is a price to pay for continuing to enforce borders and there will always be winners and losers if we continue to justify differentiating between citizens and strangers (Van Houtum and Berg, 2018).

From a spatial planning perspective, the multi-jurisdictional context associated with border regions can disturb and limit both visionary thinking and planning practice (Walsh, 2015; Walsh and Knieling, 2013). Some scholars argued that planning in cross-border areas (i.e. transboundary planning) requires the adoption of 'soft spaces' and 'fuzzy boundaries' (Allmendinger 2017; Allmendinger and Haughton, 2009). The adoption of a transboundary approach to MSP via international cooperation across borders is viewed as critical in shared marine areas (Backer, 2011). Transboundary MSP has been trialled as in various sea basins bordered by a number of coastal countries in the EU (e.g. European Atlantic; Baltic Sea; North Sea; Mediterranean) and Africa (Benguela Current Large Marine Ecosystem). This process requires policy-makers to adopt a novel strategy of politically sensitive lateral thinking which goes beyond the conventional container space of formal

administrative and territorial divisions and acknowledges the significance of functional relations across socio-economic or environmental space (Allmendinger and Haughton, 2009).

According to Guo (2018), border regions are distinctive due to their geographical and peripheral aspects. They represent geographical and political peripheries located far from their respective political units and heartlands (Guo, 2018; Wilson and Donnan, 2012) and thus embody the geographies at the margins (Cons and Sanyal, 2013). The case studies explored later in this thesis represent geographical peripheries from recent politically volatile border regions involving islands on the outermost boundaries of north-west Europe and South Asia. In addition, as key sites of British colonial rule, South Asia and the island of Ireland, among other partitioned examples, have struggled with civil wars and ethnic tensions exacerbated by the legacy of often arbitrarily drawn borders (Coakley and O'Dowd, 2007, Kumar, 1997).

2.3.1 Geography and the delimitation of maritime boundaries

From the 15th century onwards, Western European countries began to pursue colonialism. This was largely attributed by access to the Atlantic Ocean which facilitated substantial trade with the Africa, and Asia via the Atlantic (Acemoglu et al., 2005). This new trend instigated debates concerning the status of the oceans in terms of ownership and resource rights. Historically the control of marine areas has been dominated by two contradictory principles: one relating to freedom and one relating to sovereignty. According to Hugo Grotius in *Mare Liberum,* sea areas were regarded as open to all and as such nobody had the right to deny others access to them (Maier, 2016). In effect, maritime space beyond a narrow band of water adjacent to the coast was available to all and owned by nobody (Mellett et al., 2011). The philosophy of *Mare Liberum* and the principle of the oceans as global commons came to clash with the idea that countries had rights and sovereignty over their nearby waters.

A maritime boundary is defined as a 'theoretical division of Earth's water surface areas, using physiographic or geopolitical criteria' (Hasan et al., 2018: 89). It

delineates the geographic space within which states and stakeholders from various sectors can operate (Østhagen, 2019). Principles of maritime boundary delimitation have evolved over the last century from a blend of treaties and international law. The maritime delimitation process is a complex process involving the division of maritime zones of two states that overlap to distinguish the rights and obligations between the States.

Prescott (1985) and Jagota (1985) were prominent in the earlier literature by providing overviews of how maritime boundaries have been delineated across the globe from different perspectives. Prescott (1985) adopted a geopolitical approach and argued that the resolution of difficulties between states has resulted in international tensions. Resolution is invariably a matter of politics rather than maritime law (Forbes, 2001). Jagota (1985), on the other hand, focused on a more legal analysis of the development of maritime boundary law and excluded geographic or political aspects of the process. The legal regime that evolved over the past century has profoundly influenced what rights countries can claim over maritime space and marine resources.

After World War II, states signalled a desire to move away from having rights solely in a narrow band along their coast to more wide-ranging powers to control and manage their mineral resources in adjoining waters (Alexander, 1986). Maritime boundary demarcation intensified at this time, as the quest for hydrocarbon resources extended progressively offshore (Blake, 2004). The rapid development of deep-water recovery technology in the 1950s facilitated commercial exploitation of hydrocarbons. This was followed by technological developments in fishing fleets that could now access most fish stocks in the Continental Shelf. Coastal state efforts to acquire exclusive rights to manage and exploit these marine resources were inevitable and resulted in LOSC and the emergence of the EEZ (Collins and Rogoff, 1982). The establishment of the new maritime zones significantly increased the importance of maritime boundary delimitation in contemporary international law (Dundua, 2006).

Over seven decades of negotiations and planning culminated in the 1982 UN Law of the Sea Convention (LOSC). The core challenges encountered in its development were political more than legal and it became apparent that boundary agreements could only be achieved through a political approach (Rosenne, 1996). The primary goal of UNCLOS was to create a globally accepted delineation of maritime law through a comprehensive set of definitions, zones and procedures governing the use of marine resources (Boyle, 1997).

Consisting of 17 parts, 400 articles and nine annexes, the Convention is arguably one of the most important international treaties of the twentieth century (Blake, 2004). With 168 signatories to-date (UNCLOS, 2019) and most non-signatory states recognising nearly all of its key provisions as binding under customary international law, including the United States, it represents a milestone in marine political geography (Suárez-de Vivero, 2013). LOSC has evolved into a larger legal-political reality in international politics (Finnemore and Toope, 2001) setting the agenda for offshore state sovereignty and maritime boundary delimitation (Roach, 2014).

In terms of maritime zones, LOSC provides for different legal regimes and rights applicable to inland waters, territorial sea, exclusive economic zone EEZ), and continental shelf (Figure 2.2). The legal nature or status of a maritime zone, which is the object of overlapping claims, pending delimitation, is particularly relevant for the process of negotiating and establishing the maritime boundary. The 1982 Convention contains detailed provisions on the different maritime zones (Figure 2.2):

- Articles 2 to 16 deal with the territorial sea;
- Article 33 describes the contiguous zone;
- Articles 55 to 75 deal with the exclusive economic zone;
- Articles 76 to 85 cover the continental shelf.

The powers of coastal states vary from full sovereignty (internal waters) to limited sovereignty (territorial sea), customs rights (contiguous zone), to jurisdiction and economic rights over the natural resources of the Exclusive Economic Zone (Forbes,

2001). Such rights potentially extend to highly valuable renewable and non-renewable resources for fishing, energy, and mining sectors.

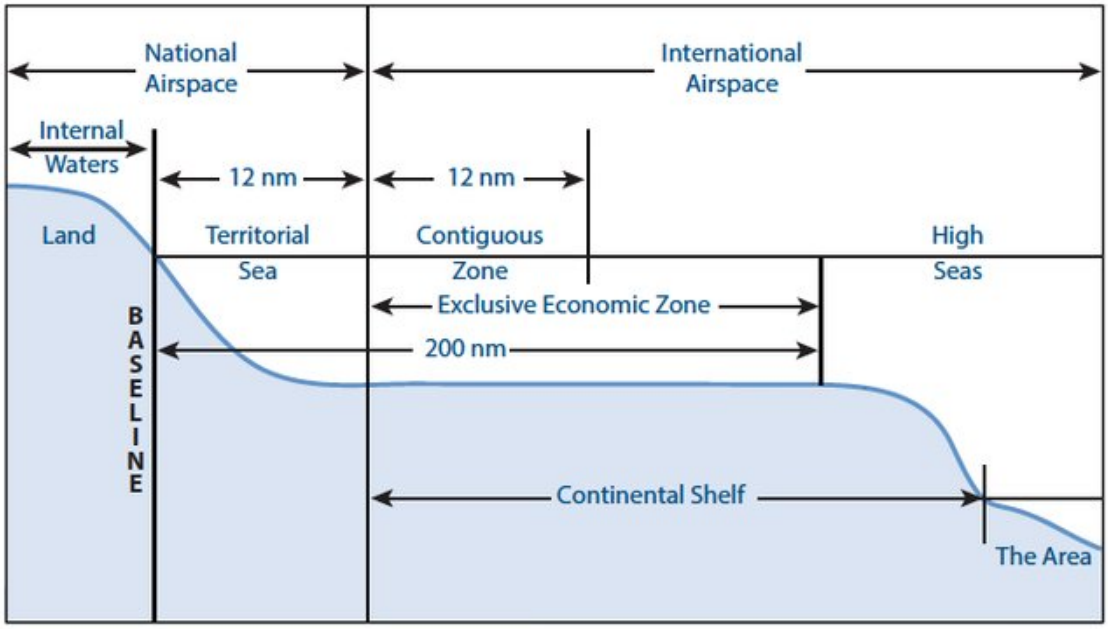


Figure 2.2: Maritime zones as defined by the Law of the Sea Convention 1982 (LOSC) (Source: Saha et al., 2019).

Both case studies presented in this thesis deal with territorial seas (rather than other maritime zones) and the implications of this zone for the approach taken to delimitation (Palk Bay) or not (Lough Foyle). Under the Convention, the outer limit of the territorial sea of each state is the line every point of which is at a distance from the nearest point of the baseline equal to the breadth of the territorial sea (Article 4). Every State has the right to establish the breadth of its territorial sea up to a limit not exceeding 12nm, measured from the baselines determined in accordance with the 1982 Convention (Article 3). The sovereignty of a coastal state extends beyond its land territory and internal waters and, in the case of an archipelagic state, its archipelagic waters, to an adjacent belt of sea, described as the territorial sea. This sovereignty extends to the seabed and subsoil (Article 2).

Article 15 focuses on the delimitation of the territorial sea between states with opposite or adjacent coasts

Where the coasts of two States are opposite or adjacent to each other, neither of the two States is entitled, failing agreement between them to the contrary, to extend its territorial sea beyond the median line every point of which is equidistant from the nearest points on the baselines from which the breadth of the territorial seas of each of the two States is measured. The above provision does not apply, however, where it is necessary by reason of historic title or other special circumstances to delimit the territorial seas of the two States in a way which is at variance therewith.

Most importantly for this thesis, in the absence of an agreement on the delimitation of the territorial sea, states with opposite or adjacent coasts may not 'extend their territorial seas beyond the median line' (Article 15). As a result, in keeping with the wider principles of equity and just outcomes that are fundamental to the spirit of UNCLOS, the median line tends to be used in these scenarios.

Article 74 focuses on the delimitation of the EEZ between states with opposite or adjacent coasts and deals with this maritime zone in a different, more prescriptive manner from the territorial seas approach described above:

1. The delimitation of the exclusive economic zone between States with opposite or adjacent coasts shall be effected by agreement on the basis of international law, as referred to in Article 38 of the Statute of the International Court of Justice[7], in order to ***achieve an equitable solution****.*

2. If no agreement can be reached within a reasonable period of time, the States concerned shall resort to the procedures provided for in Part XV[8].

3. Pending agreement as provided for in paragraph 1, the States concerned, in a spirit of understanding and cooperation, shall make every effort to enter into provisional arrangements of a practical nature and, during this

[7] Article 38(1) of the International Court of Justice divides the sources of international law into those of a primary and secondary nature. The primary sources, which the Court will consider in its decisions, include conventions (or treaties), customary law, and general principles recognized by civilised nations.

[8] The 1982 Convention Articles 279- 299; Settlements of disputes (by peaceful means); Compulsory procedures entailing binding decisions and their associated limitations and exceptions.

transitional period, not to jeopardize or hamper the reaching of the final agreement. Such arrangements shall be without prejudice to the final delimitation.

4. Where there is an agreement in force between the States concerned, questions relating to the delimitation of the exclusive economic zone shall be determined in accordance with the provisions of that agreement.

Article 83 focuses on the delimitation of the continental shelf between states with opposite or adjacent coasts and deals with this maritime zone in an identical manner as the EZZ approach (Article 74) described above but in contrast to the delimitation of territorial seas (Article 15):

1. The delimitation of the continental shelf between States with opposite or adjacent coasts shall be effected by agreement on the basis of international law, as referred to in Article 38 of the Statute of the International Court of Justice, in order to achieve an ***equitable solution.***

2. If no agreement can be reached within a reasonable period of time, the States concerned shall resort to the procedures provided for in Part XV.

3. Pending agreement as provided for in paragraph 1, the States concerned, in a spirit of understanding and cooperation, shall make every effort to enter into provisional arrangements of a practical nature and, during this transitional period, not to jeopardize or hamper the reaching of the final agreement. Such arrangements shall be without prejudice to the final delimitation.

4. Where there is an agreement in force between the States concerned, questions relating to the delimitation of the continental shelf shall be determined in accordance with the provisions of that agreement.

In addition, various maritime features that can affect how zones are determined are specifically defined by LOSC. Three of these are have distinct relevance to the case studies in this thesis; bays (Lough Foyle), semi-enclosed seas and islands (Palk Bay).

Bays are large indentations on a shoreline and are considered one of the more complex maritime features (Zacharia, 2015). A juridical bay as a "well-marked indentation…[where] its area is as large as, or larger than, that of a semi-circle whose diameter is a line drawn across the mouth of that indentation" (Article 18). The extent of control a state has over a bay is based on the distance between the low-water line on either side of the bay's entrance. If the entrance is equal to or less than 24 miles wide at low tide, then a state may draw a straight baseline across the entrance, effectively making the entire bay internal waters. If the entrance is more than 24 miles wide, a state can only draw a straight baseline 24 miles across the bay in a way that takes advantage of the total area of internal waters.

Article 122 defines enclosed or semi-enclosed seas as a 'gulf, basin or sea surrounded by two or more states and connected to another sea by a narrow outlet or consisting entirely or primarily of the territorial seas and EEZ of two or more coastal states'. States bordering an enclosed or semi-enclosed sea are obliged to cooperate and coordinate on: the management, conservation, exploration and exploitation of the living resources of the sea; the protection and preservation of the marine environment; scientific research policies and undertake where appropriate joint programmes of scientific research in the area; working with other international organisations (Article 123).

Article 121 defines an island as a naturally formed area of land, surrounded by water, which is above water at high tide. They have the same jurisdictional regime as other land masses (territorial sea, contiguous zone, EEZ and continental shelf. However, rocks which cannot sustain human habitation or economic activity are exempt.

Article 94 has specific relevant to the Palk Bay case study in terms of Flag State obligations to 'effectively exercise its jurisdiction and control in administrative, technical, and social matters over ships flying its flag'. Flag State refers to the country where a vessel is registered and every state has the right to sail ships under its flag and thus participate in international navigation. However, this right comes with

certain responsibilities (i.e. enforcing international obligations everywhere and exclusively on the high seas over their vessels. Flag State Jurisdiction typically includes management of vessel registration; effective jurisdiction and control over vessels including inspection, detention and arrest as necessary, and ensuring vessel conformity to generally accepted international rules and standards.

A prominent feature of specific relevance to this thesis is its commitment to provide a robust and wide-ranging conflict resolution system (Nemeth et al., 2014; Boyle, 2008; Borgese, 1995). However, it is important to emphasise that the dispute settlement procedures relate wholly to the delimitation of the EEZ and the continental shelf and exclude the territorial seas. Article 279 specifically requires signatories to peacefully resolve their maritime conflicts. Conflict resolution should be achieved through bilateral cooperation or exiting obligations in other agreements that specify dispute-settlement mechanisms (Article 282 and 284; Nemeth et al., 2014). Unique to international law, LOSC contains both negotiation and arbitration approaches to inter-state maritime dispute resolution. Under Article 287 (Part XV) arbitration approaches include submission to three international legal platforms:

- International Tribunal for the Law of the Sea, which is guided by rules of its founding statute including the Seabed Disputes Chamber.
- In accordance with Annex VII, the International Court of Justice (ICJ) uses the UN Charter, the statute establishing the ICJ and other founding UN documents. The Charter states that 'the parties to any dispute, the continuance of which is likely to endanger the maintenance of international peace and security, shall, first of all, seek a solution by negotiation, enquiry, mediation, conciliation, arbitration, judicial settlement, resort to regional agencies or arrangements or other peaceful means of their choice' (ICJ, 1968: Article 33.
- Permanent Court of Arbitration (PCA) which provides a permanent framework for arbitral tribunals constitute to resolve specific disputes of both private and public international law.

Despite a number of benefits that UNLCOS has delivered, it is not devoid of criticism. Even before it came into force, McRae (1984) argued that instead of improving international cooperation among coastal states, it exacerbated the global division of oceans. In relation to cooperation on environmental standards among marine organisations, it has been deemed a failure (Grip, 2017; VanderZwaag, 1996; DSH, 1988). Perhaps most critically of all, whilst it attempts to offer a maritime border regime within which states are authorised to exploit marine resources, it lacks the mechanisms that a completely functional border regime would require (Østhagen, 2019).

The text of the Convention contains many omissions and ambiguities (Blake, 2004) which have been interpreted in different ways by signatories. For example, Nemeth et al. (2006) reported that LOSC established conventions for private property rights with respect to resources of the sea. However, the text makes no specific reference to property rights regimes, despite numerous references to sovereignty and sovereign rights (Mellett et al., 2011). In contrast to the customary international law governing terrestrial territory, occupation of maritime space does not in itself imply sovereign rights (Byers and Østhagen, 2019).

A major deficiency with LOSC for Bateman (2007) is that it fails to regulate conflicting claims and border disputes as it does not provide specific requirements for resolving over-lapping claims. Whilst cooperation is required when a resource straddles a boundary, it merely prescribes an 'equitable solution' leaving it up to the parties to decide instead of specifying exactly how states should settle disputes (Byers and Østhagen, 2019). This leads to a lack of clarity concerning territorial demarcation and increases potential for conflict, which in some circumstances influences security policies (Binder, 2017). Some scholars have argued that delimitation is an essential precursor to the full realisation of the resource potential of national maritime zones and the peaceful management of the oceans and seas (Rothwell and Letts, 2019; Yiallourides, 2019; Prescott and Schofield, 2004). However, there are no sanctions when countries disregard some LOSC provisions (Blake, 2004), a key

feature underpinning the resource conflicts in the case studies of Lough Foyle and Palk Bay.

2.3.2 The complexities of maritime boundary disputes

Scholars from various fields have contributed to the existing body of literature on maritime boundary disputes focusing primarily on political, legal, and environmental aspects. Hong and Van Dyke (2009) presented a number of volatile disputes from Antarctica, Northeast Asia, and North America. Their book includes multiple perspectives on the topic including environmental considerations such as the impact of sea-level rise on maritime boundaries, and legal implications from cases that have been referred to the International Tribunal for the Law of the Sea. Schofield (2009) concentrated on disputes involving the definition of islands through technical, legal and economic analyses. From a purely legal perspective, Elferink et al. (2018) explored how states resolved 37 separate disputes developed through the case law of the ICJ and other tribunals.

A recent study from the field of political science of particular relevance to this thesis focused on how states have resolved protracted maritime disputes. Østhagen (2019: 76) reports that while 189 maritime boundaries have been agreed since the 1950s, 228 boundaries remain disputed. This figure represents 55% of the potential number of potential agreements and highlights the global scale of this issue (Table 2.1). With regards to the geographic context of the cases presented in this thesis, 35% of these disputed boundaries are located in Europe and 52% of them in Asia.

According to Hensel et al. (2008) there are six indicators that drive the salience of a maritime claim: (i) maritime borders extending from homeland rather than colonial or dependent territory; (ii) a strategic location of the claimed maritime zone, (iii) fishing resources within the maritime zone; (iv) migratory fishing stocks crossing into and out of the maritime zone; (v) the known or suspected presence of oil resources within the maritime zone; and (vi) relation of the maritime claim to an ongoing territorial claim (involving maritime areas extending beyond either claimed coastal territory or a claimed island).

Table 2.1: Total number of settled maritime boundaries and the percentage that remains disputed by continent (Adapted from Østhagen (2019), based on Ásgeirsdóttir and Steinwand (2015) dataset).

Continent	No. of Countries	No. of Boundaries	No. of Agreed Boundaries	% Disputed Boundaries
Europe	**34**	**84**	**55**	**35%**
Asia	**34**	**87**	**42**	**52%**
Africa	39	87	23	73%
North America	23	88	35	60%
Oceania	16	47	18	62%
South America	10	24	16	33%
TOTAL	**156**	**417**	**189**	**55%**

Likewise, Guo (2018) developed an analytical framework to examine to examine complex boundary disputes. His research argued that a range of interconnected factors can influence cross-border tensions and intensify a boundary dispute; resource scarcity (particularly in the Global South); locational feature; domestic politics; geopolitical competition; and cultural difference. Analysis of these factors and their interactions can help to identify and select potential solutions or alternative strategies to resolve disputes in different contexts such as resource conflicts in contested marine ecosystems.

Political boundaries are often products of particular histories or colonialism (Paasi, 2002). This corresponds with the findings of a recent meta-analysis of 184 maritime boundary agreements which reports that the historic origins of a dispute shape its parameters (Østhagen, 2019). The aftermath of de-colonisation is of specific interest in the present study which involves resource conflict in two sites of ex- colonialism in different continents. Legacies issues from colonialism continues to have a bearing some 50 years on (e.g. in Asia), and in some cases almost a century (i.e. the island of Ireland) since independence from the British Empire.

From a Global South perspective, 'Asia's colonial past is central to the many cartographic hangovers that have remained' (Singh, 2015: 348). In particular, the partitioning of Asia during the colonial era has trigged a series of border disputes in the continent because boundaries were drawn with little regard for pre-colonial history, ethnic, culture and geography of the continent (Hitoshi and Rothewell, 2014; Van Dyke, 2009b). These boundaries represent 'foreign impositions that have disrupted long-standing social relations among communities and obstructed access to traditional territories and economically important natural resources' (Shugg, 1996: 209).

Similarly, in the Global North, following independence from the British and the subsequent partition of Ireland in 1921, the delineation of the terrestrial border on the island of Ireland remains fiercely contested by some political groups (Nash and Reid, 2016). The colonial impact is felt to this day as evidenced by the century old maritime delimitation dispute relating to the border bays of Lough Foyle and Carlingford Lough which separate Ireland from Northern Ireland.

Each boundary dispute is contextually unique and dependent on the geographic, legal and political circumstances specific to the case. However, maritime and terrestrial boundaries differ in distinct ways. At sea, boundary lines can be classed as somewhat invisible or merely lines on a map (with no directly affected local residents) with no visible landmarks such as rivers or mountains that can serve as easy reference points (Østhagen, 2019). On land, occupation is central in establishing sovereign rights to territory and delimitation is based on which state has the most valid claim (Byers and Østhagen, 2018). This contrasts with the maritime domain which has its own unique international legal framework (i.e. LOSC) that has institutionalised the rights of coastal nations. In the case of contested maritime territory, two or more states can have valid overlapping legal titles to an area. In this scenario, it becomes a matter of 'reasonable sacrifice' to delimit a division in the overlapping area' (Weil and MacGlashan, 1989:91).

Table 2.2 presents selected examples of protracted maritime disputes involving contested border bays and semi-enclosed seas. From a cursory review of these cases, the existing literature tends to focus primarily on the legal aspects of the disputes. This thesis focuses on the historical and geopolitical factors that can underpin disputes that span many decades and the repercussions these frozen disputes can have for stakeholders that rely on the marine resources within the contested region.

Protracted boundary disputes can also have a significant economic dimension with financial implications for investment decisions by commercial stakeholders (Newman, 2018). Whilst the desire to exploit resources can provide the impetus to attempt to tackle sovereignty and maritime boundary issues head on, it can also prolong the process of determination. This is exemplified by the case of the ongoing Eastern Mediterranean maritime boundary dispute involving a political impasse between Cyprus, Turkey, Greece and Israel since the early 2000s (Stocker, 2012). Geopolitically and geo-strategically important, this region's reserves of oil and natural gas continue to heighten tensions in the region as each country has staked their claim to these resources (Eissler and Arasıl, 2014).

Table 2.2: Selected examples of protracted disputed border bays and semi-enclosed seas

Location	**Bordering States**	**Dispute Status**	**Key references**
Bay of Piran, Adriatic Coast	Croatia and Slovenia	Dispute unresolved; 2017 Permanent Court of Arbitration decision welcomed by Slovenia but rejected by Croatia; Marine Peace Park proposed as an alternative solution but not implemented.	Mackelworth et al. (2013); Sancin (2010); Avbelja and Cernic (2007); Arnaut (2002).
Bay of Dollart, Wadden Sea/ North Sea (East Frisian Peninsula)	Netherlands and Germany	'Agree to disagree' treaty signed in 1960 and a line was defined in 2014 but the border dispute remains	Post (2016); Franckx (1990); Tanja (1987).

		unresolved (border will remain ambiguous and that both countries will be responsible for the area).	
Carlingford Lough, Irish Sea, Island of Ireland	Ireland and United Kingdom	Dispute unresolved: Gentleman's agreement in place (i.e. median line); Cross-border agency has responsibility for management of lough.	Flannery et al. (2015); Symmons (2011; 2009).
Bay of Neum	Serbia and Bosnia and Herzegovina	Disputed- unresolved.	Spahić et al. (2017); Newman (2012).
Bay of Mali Ston, Adriatic Coast	Croatia and Bosnia and Herzegovina	Dispute unresolved.	Klemenčić, and Topalović, 2009).
Sir Creek, Arabian Sea, Indian Ocean	India and Pakistan	Dispute unresolved. Currently divided mid-creek (i.e. median line).	Mishra (2015); Padder (2012); Shah (2009); Khan (2007).

A common feature in the majority of maritime boundary disputes is their longevity (Cannon, 2019; Byers and Østhagen 2019; Østhagen, 2019; Okonkwo, 2017; Okafor-Yarwood, 2015; Rosenne, 1996). For those that manage to resolve a dispute by means of a boundary agreement, it can involve a very lengthy process. In the case of the contested Gulf of Guinea, Okafor-Yarwood (2015) argued that seeking outright delimitation is time intensive and can delay a state's ability to exploit its natural resources. From his analysis of the Guinea-Bissau and Senegal boundary determination processes, he argued that (ex-colonial) countries whose maritime boundaries are currently contested should 'strongly consider joint development agreements' as a more pragmatic alternative approach because 'international law will almost always be in favour of upholding colonial frontiers' (Okafor-Yarwood, 2015: 289).

Further alternative solutions for the resolution of boundary disputes and the effective management of transboundary resources include fair division schemes, joint resource management schemes, international peace parks, neutral zones,

buffer zones and demilitarised zones (Guo, 2018). The factors influencing boundary disputes and alternative strategies to resolve them presented by Guo (2018; 2012) are a particularly useful frame of reference when investigating resource conflicts in contested marine ecosystems.

2.3.4 Summary

From this very cursory overview of selected theoretical geopolitics and border discourses, it is evident that scholars of border studies tend to broadly gravitate towards competing conceptions, the functions and roles of borders have been continuously changing. Understanding their specific context is essential as each border is shaped by its own unique combination of history, politics and power, in conjunction with cultural and social issues. Borders are crucial geographic sites of political and spatial contestation (Salter, 2012). Borders matters because they have real effects for populations on either side as well as the resources that straddle the invisible boundary.

The sea significantly contrasts with land in terms of jurisdictions and sovereign rights. Up to the Territorial Seas, jurisdiction and rights lies with the coastal states but beyond that, marine space is regulated by LOSC and is a matter of concern for the international community (Papageorgiou and Kyvelou, 2018). This effectively limits sovereign rights and restricts that way in which states can exploit natural resources from its surrounding seas.

Maritime borders are thus arguably even more complex to demarcate than terrestrial borders particularly when natural resources straddle the potential or disputed political boundary between different sovereign jurisdictions. Environmental issues in a transboundary context are invariably entangled in complex domestic politics and international relations. Even though LOSC has been pivotal in laying the foundations for a universal framework for organising maritime space and dealing with disputes that may rise, the reality is that less than half of the potential boundaries across the globe have been completely agreed. The Convention does not necessarily provide a clear pathway to settling maritime disputes (particularly in the territorial seas).

Another major limitation is that as an international legal regime it 'may set out the rules for what is expected of actors operating in a given issue area, but it tends to lack a sufficiently rigorous parallel regime' (Jillions, 2012: 2) or law-enforcing capacity for sanctioning signatories that disregard its provisions by failing to live up to their obligations

Disputes tend to hinge on a combination of economics, geopolitics and history and these factors ultimately dictate if and how a boundary can be agreed within the context of international law. A common feature in many maritime boundary disputes is legacy issues surrounding arbitrary borders linked to colonial pasts. The literature demonstrates that reaching consensus on 'who owns what' and 'who gets what' can be elusive and it is often in this vacuum that resource conflicts emerge and escalate. Political borders are intrinsically problematic, whether formally agreed and subsequently contested or trapped in a protracted dispute, and particularly within the context of transboundary ecosystems. According to Song (2015), maritime boundaries are one of the under-studied domains in political geography. The theoretical lens of maritime border research needs to be widened to include insights from the social sciences to initiate a debate on the real-world impact of these political scenarios on shared ecosystems. This study of resource conflict in contested marine ecosystems aims to instigate this much-needed debate.

2.4 Theories of conflict analysis and resolution

2.4.1 Discourses in conflict analysis

On polar ends of a spectrum, depending on different contexts, conflict can refer simply to opposing positions, interests or demands or to war (i.e. armed conflict) (Kriesberg 1998). According to Karl Marx, conflict theory claims that society is in a state of perpetual conflict because of competition for limited resources. Social order is maintained by domination and power, rather than consensus and conformity. The wealthy and powerful try to maintain this condition by any means possible, primarily by controlling the poor and powerless (e.g. Marx, 1994; 1986; Campbell, 1991).

From the perspective of peace and conflict studies, conflict is perceived as a 'normal dynamic within human relationships' (Lederach and Maiese, 2003:15). It can be potentially beneficial and even provide opportunities for constructive change, innovation and growth (Kriesberg and Neu, 2018). The systematic analysis of conflicts can create awareness of what events in the past and the present encouraged the emergence and escalation of the current conflict. In terms of a typology of stages, previous research has suggested that conflicts tend to move through a series of phases which are not necessarily linear or bounded, and past stages may recur; emergence, escalation, de-escalation, sustaining peace (Kriesberg and Neu, 2018; Kriesburg and Dayton, 2016). Conflict emergence relates to events or underlying factors that precede conflict escalation where latent could become potential conflict inducing forces (Coleman et al., 2007). The interaction of adversaries is the fundamental determining factor of the speed, duration and destructiveness of a conflict's escalations (Dayton and Kriesberg, 2009; Glassl, 1999). De-escalation involves a turning point at a given time when possible new options mark a shift in the conflict from confrontation to the negotiation of agreements (Touval and Zartman, 2001). This is perhaps the most elusive stage transitioning from conflict to reconciliation and building legitimate institutions of governance for enduring peace (Kriesberg and Neu, 2018; Pouligny et al., 2007; Walter, 2002).

Wall and Callister (1995) consider escalation as a process of increased intensity or worsening of the conflict. It can also refer to increases in the number of participants (Kriesberg and Neu, 2018; Kriesberg, 1997) or events (Jehn, 1997) related to a conflict. Glasl's (1999) escalation model suggested that conflict management strategies should be based primarily on conflict intensity. Yasmi et al. (2006) adapted this escalation model to understand how conflict intensifies over time within the context of conflict in natural resource management (NRM). They reported that escalation patterns in this area range vastly from light disagreement to open war, involve multiple types of stakeholders, and can be categorised in eight escalation stages. This typology of escalation (Table 2.3) is a valuable tool for the analysis of different resource conflicts presented later in this thesis.

Table 2.3: Continuum of conflict escalation in Natural Resource Management and their associated characteristics (Adapted from Yasmi et al., 2006 and based on Glasl, 1997).

Stage	Description	Indicator/ Characteristics (non-exhaustive)
1	Feeling anxiety	Worry, complaints, rumours, suspicion, fear of job losses.
2	Debate and critiques	Open debate, verbal clashes, accusations, critique of government policy.
3	Lobby and persuasion	Lobbying government and/ or politicians, compensation sought.
4	Protest and campaigning	Public protests, demonstrations, media campaigns.
5	Resource access restriction	Blockading ports, displacement, prevented from working in certain areas.
6	Legal case	Arrests, litigation, lawsuits.
7	Intimidation and physical exchange	Physical threats, confiscation, violent clashes, injury, loss of life, shooting, military action.
8	Nationalisation and Internationalization	Protest in national and international media, bilateral negotiation.

Intractable conflicts are long-term, complex and dynamic conflicts that are extremely resistant to change despite genuine efforts to resolve them (Coleman, 2006). Frames can influence the intractability of conflicts by reinforcing irreconcilable interpretations of events or developments. Applying a multi-perspective framework to develop a comprehensive understanding can provide key opportunities for re-framing a conflict in way that may lead to constructive and sustainable transformation of enduring conflicts (Breunlin et al., 1997; Morgan, 1997). When it comes to root causes of conflict, it is important to acknowledge the people can have divergent perspectives. By designing a methodological approach that intentionally compels us to look beyond our initial framing and consider the conflict from other

perspectives, new leverage on difficult problems can emerge through 'frame breaking' insights into viable alternatives (Morgan, 1997).

The concept of 'framing' was first proposed by Bateson (1972) as an analogy to 'context' followed by a number of other scholars of anthropology and sociology (e.g. Geertz, 2003: 1973; Benford and Snow, 2000; Bernstein, 1996; Snow et al., 1986; Douglas, 1978). He defined frames as a 'spatial and temporary bounding of sets of interactive messages' (Bateson, 1972: 197). Past experiences are stored and used as a lens or frame from which to interpret subsequent experiences and events (Drake and Donohue, 1996).

Goffman (1974) refined the concept and presented 'framing analysis' as a theoretical, methodological, and critical tool for exploring how situations are defined. Goffman's approach is based on the theory that making sense of social situations is achieved by constructing meaning through frames of understanding (Allen, 2017). Frame analysis argues that people classify their experiences according to two guiding frames of reference: natural and social frameworks (Goffman, 1974). Natural frameworks identify events as physical and undirected occurrences, whereas social frameworks involve rules, they are socially distributed and shared, and provide a way of describing the events to which they are applied. Primary frameworks thus help the individual to describe events, interpret data, and attach social meaning so that their experiences can be understood in a wider social context.

The concept of frames has been applied as a tool of analysis across many fields in the social sciences, including sociology and psychology (Taylor, 2000; Strydon, 1999; Bazerman, 1984); business management (Goldratt 1990; Watzlawick et al., 1974); conflict negotiation (Gray, 1989; Neale and Bazerman, 1985) and environmental conflict resolution (Lewicki et al., 2003). However, whilst a framing approach has constructive potential in analysing stakeholder perspectives on resource conflicts, it is important to acknowledge that framing can be an imperfect and subjective process because individuals can mis-frame experiences or frame them ambiguously (Goffman, 1974). Kaufman et al. (2003) contend that framing can significantly impact

the complexity of conflict by creating mutually irreconcilable interpretation of events.

2.4.2 Resource conflicts as complex problems

Our lives are filled with complex problems and we strive to find a coherent framing and by doing so, we make assumptions (i.e. framings) to reduce the complexity and fill knowledge gaps (Van Eeten, 1997). Drawing on Allen's (2001) work on complexity science, the complexity of a resource conflict is increased by the implicit assumptions of diverse stakeholders through the ways in which they perceive, interpret and frame the 'actual' problem. These different framings inherently influence and steer the identification and selection of acceptable solutions for problems (de Man, 2016; Warner, 2008). Walters et al. (2000) provided the following list of criteria to help define the gravity of a given problem: degree of conflict over the issue; number of stakeholders impacted or involved; level of confidence in the data and information available; number of alternatives to resolve the issue; knowledge of the potential outcomes; probability of the potential outcomes.

Rein and Schön's (1994) book on intractable policy controversies developed the concept of frame-reflective analysis. This approach is characterised by specific patterns of socio-political interactions. It regards frames as perspectives from which ill-defined problematic situations are given meaning by people and institutions; and conditions that produce intractable problems are highly political. Stakeholders involved in such scenarios (e.g. resource conflicts) must be able to 'put themselves in the shoes of actors in the environment, and they must have a complimentary ability to reflect on their own action frames: they must overcome the blindness induced by their own ways' of framing the problem (Rein and Schön, 1994: 187).

Building on the earlier theories of Rein and Schön, Hisschemöller and Hoppe (2001; 1995) designed a problem structuring framework to categorise the complexity of policy problems. Problems are 'structured' where a high degree of consensus or certainty exists in relation to relevant data and information. 'Unstructured' problems

have a high degree of disagreement in terms of norms and values. Figure 2.3 illustrates four types of problems mapped out in these two dimensions:

- Simple (structured) problems are categorised by little to no conflict. The problem is readily recognised and problem-solving is straightforward.
- Untamed (unstructured) technical problems considered as important to solve but for which no technical solution has yet been reached.
- Untamed (structured) political problems where conflict exists because stakeholders frame the problem from different perspectives. Technical solutions are available, but their application has already or will ultimately be met with societal conflict and blocked by stakeholders.
- Wicked (unstructured), complex problems characterised by high conflict due to the ambiguity of the problem, political and resource constraints and high number of stakeholders involved. Agreement on problem definition and the required relevant data and information is absent.

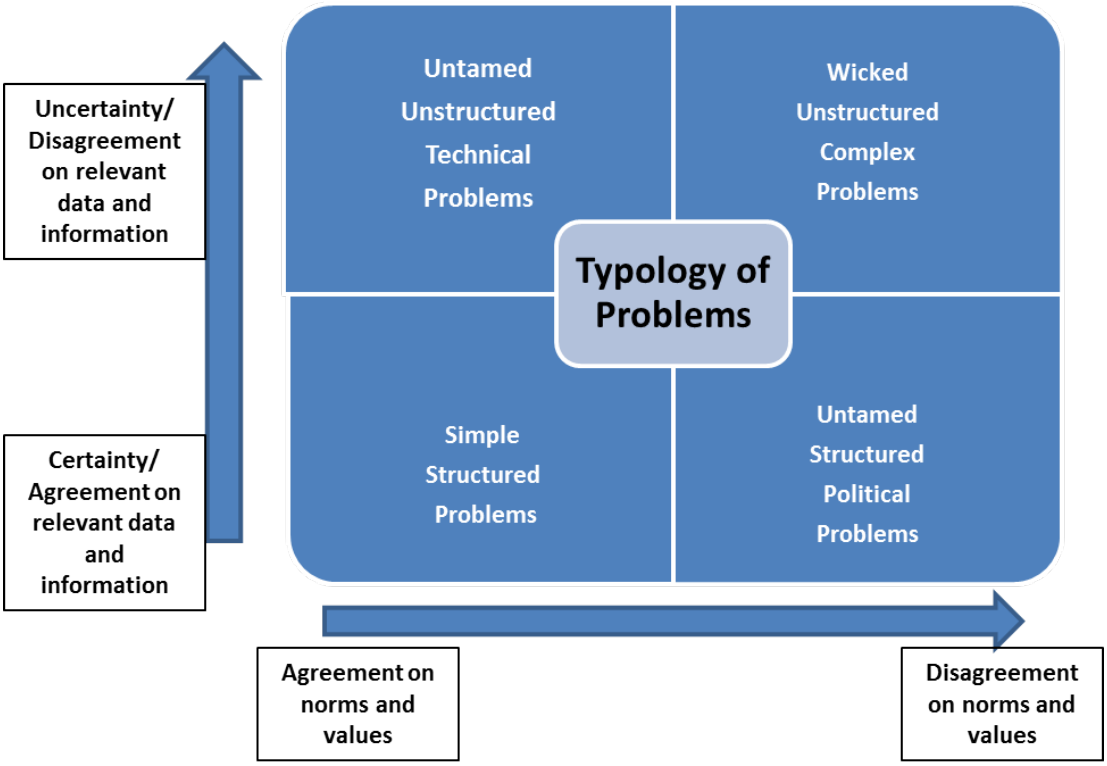


Figure 2.3: Typology of problems (adapted from de Man, 2016; Hisschemöller and Hoppe, 2001; 1995).

de Man (2016) applied this framework to a resource conflict between Palestine and Israel in the politically volatile region of the West Bank. Based on his research, he proposed an analytical framework for effective transboundary cooperation based on the recognition of uncertainties and political realities, drawing together the complex interlinkages associated with transboundary environmental governance where conflict prevails. His research argued that the complexity of a conflict is increased by the divergence of stakeholder interests and the ways in which they frame the problem. It also illustrated how a combination of the far-reaching impact of (non-) decisions and the range of uncertainties at stake created an untamed political problem rather than a wicked problem.

Whilst Balint et al. (2011) emphasise that not all environmental problems rise to the level of 'wicked', a host of natural resource conflicts have been framed as 'wicked problems' in the literature. Examples include natural resource management (DeFries and Nagendra, 2017; Parrot, 2017; Lockwood et al., 2010); water resource management (Fischer et al., 2017; Hearnshaw et al., 2011; Pahl-Wostl et al., 2005) transboundary water management (Head, 2016; Jagerskog, 2003); flood-risk management (Mguni et al., 2014); waste-water management (de Man, 2016) transboundary lake management (Kharel et al., 2019; Karkkainen); fisheries management (Jentoft and Chuenpagadee, 2009), and coastal and marine governance (Groeneveld, 2020; Jentoft and Chuenpagadee, 2009).

The concept of wicked problems was developed in planning literature and subsequently in public policy analysis in response to a perceived increase in the difficulties of making policy over forty years ago (Peters, 2017). Coined by Rittel and Webber (1973), wicked problems are difficult to define, resist rational solutions and are inherently unsolvable in comparison to tame problems that have obvious solutions. They tend to take on a 'complexity that often extends well beyond the merely intricate and assumes many forms, including high levels of risk; scientific uncertainty; biological complexity; social complexity; vast scope and scale of issues involved; and the absence of a clear public consensus on values, the nature of the problem, or acceptable solutions' (Balint et al., 2011:9).

Several authors have reported that resource conflicts fall under the category of wicked problems when they involve multiple stakeholders in multiple organisations across multiple jurisdictions that may perceive and understand the core issue differently (Head et al., 2018; Parrot, 2017 Weber and Khademian, 2008; Roberts, 2000). Wicked resource problems ignore the boundaries that shape our public sphere and the responses to address them need to 'transcend these boundaries, including governmental, sectoral, jurisdictional, geographic, and even conceptual demarcations' (Emerson and Nabatchi, 2015:7). The fact that wicked problems cannot be addressed by a single organisation acting alone means that a collectively accepted solution through some form of collaboration is required (Parrott, 2017; Fischer et al., 2017; Hocking et al., 2016; Emerson and Nabatchi, 2015). The primary focus should be on problem formulation (or framing), based on discussions with stakeholders, to incorporate their perspectives (Mitroff and Linstone, 1993) and to ensure that all relevant variables are included in the analysis (Wassen et al., 2011).

It is important to recognise that the concept of wicked has attracted criticism in recent years. Peters (2017:365) argued that 'almost any problem that is difficult to solve and which has a variety of alternative causes, or alternative policy frames, has been described as a wicked problem'. The term 'wicked problem' has become inflated and over-used (Alford and Head, 2017). Similarly, Turnbull and Hoppe (2019) reject the notion of wicked problems as representing a special class of policy problems. They proposed an alternative conception of a continuum from unstructured to structured signifying a lower to higher degree of problematicity or structuredness of problems.

2.4.3 Discourses in conflict resolution

Over 50 years ago, one of the most cited scholars in peace studies, Galtung (1969) presented a typology of conflict interventions to demonstrate four different approaches to conflict resolution: (i) conflicting parties communicating only with each other; (ii) minimal involvement of an outside party; (iii) active communication-involvement of an outside party; and (iv) imposed conflict 'solution' by means of mediation or arbitration. However, this typology has been criticised because it fails

to consider significant factors such as why and how the conflict has come about (i.e. conflict analysis) (Wallensteen, 2015; Mitchell, 2013).

Building on these earlier concepts, contemporary theoretical perspectives in the field of conflict resolution draw many of its principles from alternative dispute resolution (ADR). In contrast to litigation and other confrontational modes of conflict resolution, ADR falls outside judicial procedures (Boudreau, 2008). The term refers to a variety of collaborative approaches including conciliation, negotiation, and mediation which have been used in environmental management (Emerson et al., 2017; Mitchell, 2013; Anderson, 2010; O'Leary and Yandle, 2000; Buckles and Rusnak, 1999).

Conciliation involves efforts by a neutral third party to communicate separately with disputing parties in order to decrease tensions and reach agreement on a process for resolving a dispute (Ramsbotham et al., 2011). Negotiation is a voluntary process in which parties agree to meet with the purpose of reaching a mutually acceptable resolution to the conflict (Bercovitch and Lumar, 2010). Mediation involves the assistance a mediator (i.e. a neutral third party) to helps the parties in conflict jointly reach consensus in a negotiation process but has no power to direct the parties or enforce a solution to the dispute (Bercovitch, 2011; Bercovitch et al., 2009;). Through a process of ADR, 'multi-party "win-win" options are sought by focusing on the problem' (not the stakeholders) and by 'creating awareness of interdependence among stakeholders' (Buckles and Rusnak, 1999:5)

Conflict transformation is a theoretical approach that goes a stage beyond resolving specific disputes (i.e. conflict resolution). From this school of thought, peace is viewed as a 'continuously evolving and developing quality of a relationship' (Lederach and Maiese, 2003:20). Conflict transformation is characterised by a participatory process that focuses on exploring the content, context and structure of social relationships (Lederach and Maiese, 2003). Other scholars regard it as a long-term, multi-dimensional, systematic and adaptive strategy aimed at constructive transformation by means of trust-building dialogue and mutually acceptable solutions (Bloomfield et al., 2006; Miall, 2004).

What differentiates conflict transformation from others in the field is the desire to focus on the wider and deeper contexts from which conflict emerges and an emphasis on recognising that need for long-term change and grass-roots empowerment (Ryan, 2013). Within the context of resource conflicts in contested regions, applying a strategy of conflict transformation would entail not only addressing its root cause and resolving the conflict between stakeholders. It would also involve designing a long-term strategy and implementing a stakeholder dialogue mechanism that would help to reduce or prevent future conflict and to facilitate the co-production of alternative solutions to problems as and when they arise.

Some scholars in the field emphasize that the effectiveness and suitability of certain methods of ADR and conflict transformation vary greatly among different social groupings in different cultural contexts (Zartman and Touval 2001; 1985; Cohen, 1997). Many of the principles of these approaches which promote collaborative approaches have primarily emerged from cultural contexts in the Global North. These techniques rely on enabling conditions such as a readiness to acknowledge a role played in the conflict and a willingness to provide support and resources to implement negotiated solutions (Bingham, 2011; Sairinen, 2011; Mayer, 2010 Buckles and Rusnak, 1999).

Cultures are embedded in every conflict because conflicts arise in human relationships (Zartman and Faure, 2005). Culture influences how we describe or frame conflicts and also the ways in which we approach conflict resolution (LeBaron and Pillay, 2004). In many cases, different points of view are formulated based on cultural values, beliefs and personal experiences. Hall's (1976) Iceberg of Culture Model uses the analogy to argue that we can only ever observe 10% of culture and the other 90% is hidden beneath the surface (Figure 2.4). The visible, external (conscious) part of culture represents the tip of the iceberg and includes some behaviours and beliefs. The invisible, external (subconscious) component is below the surface of society and consists of core values and underlying assumptions that determine behaviour. Hall's model is a systems-thinking tool designed to help an

individual or groups discover how patterns of behaviour are influenced by cultural dimensions.

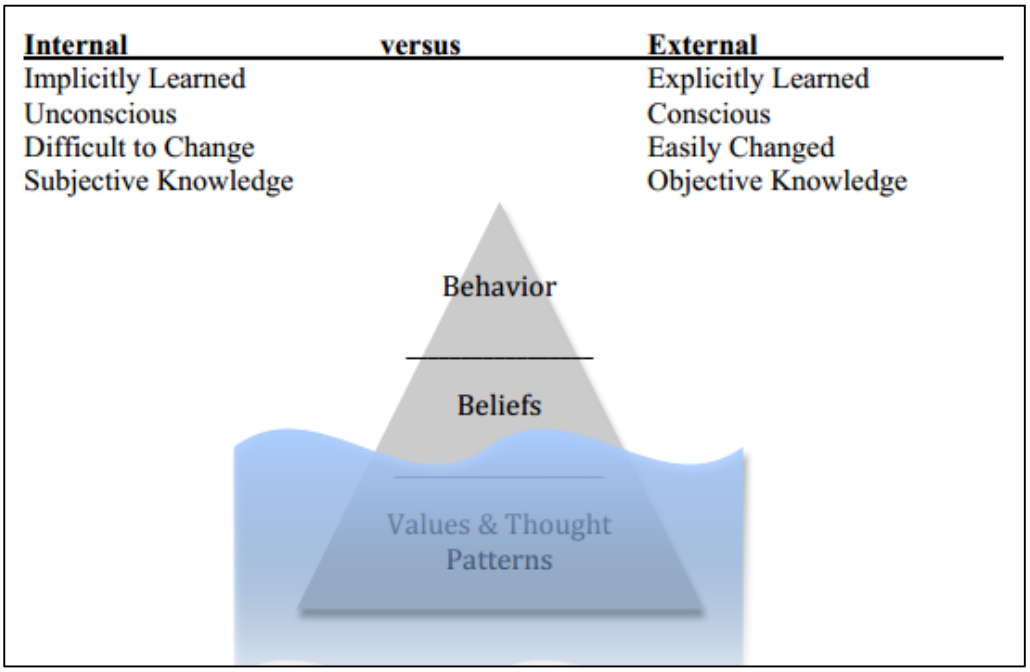


Figure 2.4: The Iceberg of Culture Model (Source: Hall, 1976).

Some forms of conflict are inextricably linked to culture but may not necessarily cause it (LeBaron and Pillay, 2004). No culture can be categorised as wholly peaceful or violent. As Brand-Jacobsen (2002:18) argued that 'just as there are elements of violence within almost every culture in the world, there are also elements of peace culture'. As this thesis involves resource conflicts between countries and stakeholders from different cultural backgrounds, it was important to acknowledge Hall's theory of culture when interviewing key informants and also in the interpretation of the views they share during the interviews.

2.4.4 Discourses in natural resource conflict and environmental cooperation

Research on the role of natural resource in contributing to conflict and the potential for cooperation among states has been reviewed extensively in the literature (Ratner et al., 2017; 2013; Le Billion, 2012; Scheffron and Battaglini, 2011; Matthew et al., 2009; Welsch, 2008). Earlier scholars in the sub-field of natural resource conflict focused on three broad themes linked almost exclusively to resource scarcity; (i) resource scarcity and social breakdown (a neo-Malthusian approach); (ii) preventing

conflict by developing institutions to conserve natural resources (a neo-classical economist approach); and (iii) maldistribution of resources as a key factor for conflict and poverty (a distributionist approach) (Haas, 2002; Percival and Homer-Dixon, 1998; Homer-Dixon, 1995; 1994).

Auty (1995; 1994) drew attention to an opposing concept; 'resource curse' whereby resource abundance was connected to negative economic growth as it is a factor that could trigger conflict. Other scholars extended this theory and proposed that resource abundance and dependency were central components in civil war (De Soysa, 2000; Ross, 1999; Collier and Hoeffler, 1998). Martin (2005) reported that some studies also began to highlight that environmental change facilitated both peace and conflict, depending on contextual factors and political agency. Linked to these concepts, the geopolitics of natural resources role and conflict has also been comprehensively reviewed (e.g. Le Billion, 2013; 2012; Ross; 1999). According to Le Billion (2013), geopolitical competition and resource conflict are largely rooted in the political and economic vulnerabilities of resource dependent states. From his perspective, mis-governance and resources conflicts are inherently linked to the historical legacy and exploitation of natural resources by imperial powers.

Debates about environmental resources and the relationship with conflict and peace building began to emerge from the 1990s in the fields of conflict studies, development studies, political science, political geography, political ecology and climate change (Waisová, 2017; Frerks et al., 2014). One of the initial theoretical perspectives of most relevance to this thesis viewed environmental cooperation as a useful mechanism for peacebuilding and conflict transformation (Brock, 1991). In his seminal research, Brock (1991) advanced the theory that environmental stress creates favourable conditions for adjoining jurisdictions to cooperate across borders to solve mutual problems. A subsequent analysis of more than 1800 case studies of freshwater conflicts and treaty negotiations (Wolf, 1997) laid the foundations for further research into the transformative peacebuilding potential of environmental cooperation for states sharing water resources.

Current theoretical thinking recognises that natural resource degradation and scarcity are factors in the emergence of conflict, but violent conflict is rarely resource driven (Frerks et al., 2014). Resource conflicts are currently framed as a by-product of the mismanagement of resources or more widely to the nature of environmental governance regimes (Adano et al., 2012). From the late 1990s onward, the focus of environmental conflict research has evolved to consider natural resource governance as a mechanism to foster a culture of environmental cooperation and peacebuilding in order to help resolve resource conflicts (Conca, 2018; Bruch et al., 2016; Barquet, 2015; Adano et al., 2012; Bavinck et al., 2014a; Bruch et al., 2009; Conca and Dabelko, 2002). In particular, the value of conflict as a catalyst for positive social change was highlighted by Buckles and Rusnak (1999) through a collection of ten case studies of natural resource conflicts. The necessary conditions to move from conflict to collaboration are identified in each context through two basic steps: conflict analysis and planned multi-party intervention.

Carious (2006) proposed that three broad sets of (sometimes overlapping practices) fall under the umbrella of environmental peacebuilding: activities to prevent or mediate environment-related conflict; initiating and establishing transboundary environmental cooperation through dialogue and joint-problem solving on shared environmental challenges; and reaching long-term sustainable solutions and management regimes nested within the larger economic, political and institutional frameworks. The unique 'biophysical environment's inherent characteristics can act as incentives for cooperation and peace, rather than violence and competition' (Dresse et al., 2019:99). Based on this assumption, 'environmental peacebuilding presents cooperation as a win-win solution and escape from the zero-sum logic of conflict'.

A host of scholars have argued that environmental cooperation and conflict resolution in shared ecosystems should be an imperative for governments and stakeholders for the following ecological, socio-economic and geopolitical reasons:

- Environmental issues often transcend political borders and only a bilateral (or multi-lateral) approach can support ecological integrity of a shared ecosystem.
- Transboundary environmental cooperation can trigger direct and indirect economical improvements to local populations (e.g. employment in eco-tourism); and
- Whilst environmental challenges can create tension between states, they also provide an opportunity for cooperation and integration and can thus have a catalytic effect on wider political dialogue in the region (Mackelworth, 2016; 2012; Waisová, 2015; Dabelko, 2006; Phillips et al., 2006; Sadoff and Grey, 2005).

More recently, it has been argued that the environment is a peacebuilding tool that offers some unique qualities that align well with building peace and transforming conflict (Conca et al., 2018). 'Environmental challenges ignore political boundaries, require a long-term perspective, encourage local and non-governmental participation, and extend community building beyond economic linkages' (Conca et al., 2005:149). These factors are particularly relevant to resource conflicts in contested ecosystems.

Environmental cooperation, especially between two or more countries, is contingent on two interdependent themes which relate to political theories of environmental resource management; political interest and political will (Smidt et al., 2014; Mollinga, 2008). In terms of environmental resources and resource conflict, political interest refers to the positions of those in political power that have the ability to steer the way in which resources are allocated or exploited or how a conflict evolves. Political will describes the motives or agenda of the political leadership, their engagement with the resource management regime and their willingness address a resource conflict. Political interest can be viewed as more static whereas political will can be influenced by lobbyists and is therefore more liable to change. Levels of political interest and political will in transboundary environmental matters are shaped by the current political state of the individual countries involved as well as

the existing geopolitical relations in the wider region. This explains the way in which governance frameworks deal with resource conflicts; at times, open to negotiating a resolution through cooperation even encouraging, or alternatively leaving certain issues in a void (Smidt et al., 2014: 81-82).

Lessons from the field of water management indicate that political willingness to cooperate in the management of transboundary resources hinges on economic and political advantages that can be achieved overall unilateral approaches and when these larger benefits are shared (Grey et al., 2009). Applied to the marine environment, benefits can take four forms: (i) environmental benefits *to* the ecosystem (e.g. improved water quality, conserved biodiversity); (ii) economic benefits *from* the ecosystem (e.g. increased food production); reduction of costs *because of* the ecosystem (e.g. reduced geopolitical tensions; less duplication of activities); and (iv) benefits *beyond* the ecosystem (e.g. encouraging more integrated processes and catalysing wider cooperation in other economic activities) (Grey et al., 2009; Sadoff and Grey, 2005; 2002)

Waisová (2013) provided a functional classification of environmental cooperation intensity in conflict-prone areas which can be applied as an analytical framework for assessing the status quo and proposing solutions to resource conflicts. Intensity of cooperation is classified on a graded continuum from non-cooperation (i.e. no exchange of information or resistance to engage) to fully integrated coordination (i.e. joint management of environmental resources) as illustrated in Figure 2.5. Several studies have demonstrated that whilst cooperation can be impeded by multiple obstacles, political conflict and environmental cooperation can co-exist more or less in parallel (Smidt et al. 2014; Ratner et al., 2013; Waisová, 2013). Examples of the challenges encountered included: changeable political will from governments; distrust between stakeholders, a volatile political and security environment and more buy-in from non-governmental stakeholders rather than central government representatives,

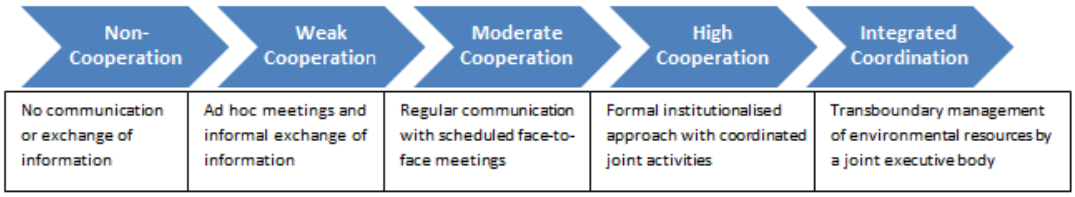


Figure 2.5: A graded continuum of environmental cooperation presenting different levels of intensity (adapted from Waisová, 2013; Sandwith et al., 2001; Zbicz, 1999b).

Conflict is often considered as the antithesis of cooperation; however, it is important to acknowledge that cooperation is not always the preferred or ideal state. Some forms of cooperation exist that can perpetuate inequality and resource degradation. For example, a recent case study highlighted how Israeli- Palestinian environmental cooperative activities in transboundary water-management are characterised by 'mutual suspicion and hostility' (Selby, 2013) and mirror the 'structural inequalities and power disparities, as well as the deeply engrained conflict discourses, fears, and intra-group pressures and expectations' inherent in the wider region (Reynolds, 2016: 712). The environmental cooperation- conflict nexus is discussed further in the next section within the context of transboundary conservation initiatives.

2.4.5. Transboundary environmental cooperation initiatives in practice: Resolving conflict through Peace Parks

The term 'Transboundary Conservation Area (TBCA)' is a generic term that covers different types of Protected Areas. The following are relevant to this thesis: a Transboundary Protected Area (TBPA): a 'clearly defined geographical space that consists of protected areas that are ecologically connected across one or more international boundaries and involve some form of cooperation'; a Transboundary Conservation Landscape and/ or Seascape: an 'ecologically connected area that sustains ecological processes and crosses one or more international boundaries, and which includes both protected areas and multiple resource use areas, and involves some form of cooperation'; and a Transboundary Peace Park (TBPP) which is a special designation that may be applied to any of the above Protected Areas, but is specifically 'dedicated to the promotion, celebration and/or commemoration of

peace and cooperation' (Vasilijević et al., 2015:xi). According to Waisova (2015; 2014), some of the early authors (e.g. Westing, 1998) worked as environmental specialists and supported the development of transboundary peace parks to prevent ecosystems degradation linked to violent armed conflicts. Regardless of this nuanced classification, all types of transboundary initiatives require cooperation and political commitment across boundaries (Mackelworth, 2012).

Examples of transboundary conservation initiatives have undergone rapid expansion since the 1980s, in parallel with the growth of designated protected areas at the national level (Vasilijević et al., 2015; Sandwith et al., 2001). There are many different ways to initiate and govern agreements for transboundary cooperation, both formal and informal (Vasilijević et al., 2015). There are currently in excess of 200 examples of transboundary cooperation, ranging from informal agreements to government-to government treaties across the globe (Waisová, 2017). There is extensive literature focusing on the factors influencing the success and failure of transboundary environmental cooperation which include; shared vision and values (e.g. social, environmental, religious etc.); availability of long-term funding; political stability in the region; sustained political will and commitment; peripheral geographic location; engagement of multi-disciplinary professionals; engagement with multi-sector stakeholders regular joint-technical meetings; joint scientific research and monitoring programmes; joint legislation and management plans (Portman and Teff-Seker; 2017; Mackelworth, 2016a; 2014; Barquet et al., 2014; Hamilton, 2001; Sandwith et al., 2001).

A host of research has expanded the concept of peace parks in different environmental contexts as an instrument of conflict transformation. Examples include de-militarised zone (DMZ) peace parks (Hayes and Cavazos, 2013; Alsdirawi and Faraj, 2003); transboundary protected areas (Budowski, 2003); trans-frontier nature reserves (Westing 1998; Conca et al., 2002; Zbic, 1999); and marine peace parks (Portman and Teff-Seker; 2017; Mackelworth et al., 2016; 2013; Mackelworth, 2012; Portman, 2007).

Mackelworth (2012) explored the concept of combining conservation issues with resolving conflict by developing regional ownership over a shared marine space between adjoining coastal states through marine peace parks. His review of nine transboundary marine conservation initiatives helped aimed to develop the debate on developing marine peace parks in conflict prone regions. A selection of these transboundary initiatives is presented in Table 2.4 in terms of their level of success in cooperative approaches to-date.

Table 2.4: Selection of transboundary marine conservation/peace park initiatives in the Global North and Global South (adapted from Mackelworth, 2012).

Continent	Initiative, location and key reference	Participating States	Maritime border status	Level of success
Europe	Wadden Sea Forum, North Sea (Enemark, 2016)	Denmark, Germany, The Netherlands	Agreed	Trilateral political declaration; Coordinated management; High political commitment.
	Bonifacio Strait Marine Park, Mediterranean (Chevalier and Officer, 2004)	France, Italy	Agreed	Bilateral political protocol; declined in political will.
	Pelagos Sanctuary for Mediterranean Marine Mammals (Notarbartolo-di-Sciara et al., 2008)	Monaco, Italy, France	Agreed	Trilateral political agreement; decline in political will.
	Bay of Piran (Proposed Peace Park), Adriatic Sea (Mackelworth et al., 2016)	Slovenia, Croatia	Contested by Croatia	Border uncertainty and lack of political will have suspended implementation.
	Turtle Islands Heritage Protected Area, Sulu Sea (Miclat and Nunez, 2016)	Malaysia, Philippines	Agreed	Bilateral political agreement; decline in political will; Separate management plans.

Asia, Middle East	Red Sea Marine Peace Park, Gulf of Aqaba (Portman, 2007)	Israel, Jordan, (United States)	Agreed	Cooperative research; decline in political will; No joint-management plan.
	Korean Marine Peace Park, Yellow Sea (Nam and Kang, 2016; Nam et al., 2007)	North Korea, South Korea	Contested by both States	Joint committee established; Minimal cooperation to-date.

A common theme emerging from these examples is that the initial political will for environmental cooperation with neighbouring states is not always sustained as time goes on. Furthermore, within the context of this study, it is important to note that the two proposed marine peace parks with contested borders (i.e. Bay of Piran and Korean Marine Peace Park) have failed to progress beyond the planning phase due to ongoing uncertainty and hostility linked to the border disputes.

2.4.6 Summary

The theoretical concepts and guiding principles of conflict analysis and resolution presented in this section have highlighted the importance of viewing resource conflicts from multiple perspective. The systematic analysis of different stages of conflict can create awareness of what events in the past and the present encouraged the emergence and escalation of the current conflict. The continuum of conflict escalation (Yasmi et al., 2006 based on Glasl, 1997) provides a useful tool to unpack how resource conflicts intensify over time.

The way in which the root cause of conflict is framed by different stakeholders on either side of a border is a critical factor in the field. It is essential to look beyond our own cultural biases and initial framing to assess the conflict from other perspectives in order to formulate constructive steps towards resolution. Intractable problems such as the long-lasting resource conflicts in contested regions analysed in this study are highly political. Re-framing the ways in which we describe these problematic

conflicts (e.g. complex and wicked or untamed and technical) can influence the selection of acceptable solutions.

Cooperation generally implies working together and levels of intensity from zero to high can be graded on a continuum from non-cooperation or weak cooperation (e.g. ad-hoc exchange of data and information) to integrated coordination (e.g. co-management of resources). The key challenge for effective cooperation is that its effectiveness is contingent on sustained political interest and political will on both sides of the border combined with stakeholder buy-in. Whilst the application of environmental cooperation as a tool for political conflict resolution has gained much attention in recent years, there is evidence (e.g. marine peace parks) that it has failed to live up to expectations and has often been ineffective in border-regions with a long history of political conflict.

2.5 Theories of governance and management in the marine environment

This section provides an overview of various theoretical arguments drawn from the fields of environmental governance and environmental management. Various best practice principles in governance and EBM are reviewed within the context of their suitability to address complex resource conflicts in contested marine ecosystems.

In the broader social sciences, governance is differentiated from the term government and embody a 'change in the meaning of government, referring to a new process of governing; or the new method by which society is governed' (Rhodes, 1996: 625-3). The outputs of governance are not necessarily different from that of government (i.e. ordered rule and collective action) but the process for achieving these outcomes has changed (Stoker, 2019). Its theoretical roots vary across multiple disciplines spanning economics, international relations, political science and public administration (Jessop, 2003). However, there seems to be a general acceptance that governance refers to the development of governing styles in which the 'boundaries between and within public and private sectors have become blurred' (Stoker, 2019: 17).

The general consensus over the past few decades is that effective environmental governance was impeded by the 'continuing presumption of the state as central actor in the domestic and international political contexts' (Sampford, 2002:79). Complex environmental issues call for appropriate governance solutions. However, contemporary arrangements are not always suitable for that specific task. Traditional top-down government-led approaches to decision-making cannot always facilitate the required environmental outcomes due to the complexity and number of stakeholders involved (Armitage et al., 2012). The gradual regime shift from government to governance in the literature has thus emerged in response to a desire for more active involvement in non-state actors in decision-making processes concerning the regulation and management of natural resources (Bennett and Satterfield, 2017; Armitage et al., 2011; Termeer et al., 2010).

2.5.1 Discourses in Environmental Governance

Discourse in environmental governance reflect different assumptions and often competing ideologies in terms of the manner in which natural resources should be managed and by whom (Glasbergen, 1998). A large body of academic literature has emerged in recent decades offering a host of interrelated theories and analytical frameworks. Environmental governance scholars have developed theories in a range of sub-fields: good governance (Van Putten et al., 2018; Bennet and Satterfield, 2017; Lockwood 2010; Lockwood et al., 2010; Graham et al., 2003); common-pool resource governance (Armitage, 2008; Agrawal, 2003; Ostrom, 1999; Oakerson, 1992); interactive governance (Jentoft and Bavinck, 2014; Kooiman and Bavinck, 2013; Chuenpagdee, 2011; Chuenpagdee and Jentoft, 2009; Kooiman et al., 2008; Kooiman and Bavinck, 2005); institutional governance (Adger et al., 2005; Paavola, 2007); adaptive governance (Armitage et al., 2011; 2009; Plummer and Armitage, 2010; Brunner, 2005; Folke et al., 2005), collaborative and participatory governance (Newig et al., 2019; Bodin, 2017; Gaymer et al., 2014; Newig, 2012; Armitage et al., 2009, Newig and Fritsch, 2009; Muro and Jeffrey, 2008; Imperial, 2005) and most recently, transition governance (Lange et al., 2018); transformative governance (Kelly et al., 2019) and evolutionary governance (O'Hagan et al., 2020).

Whilst a comprehensive review of all of the above-mentioned theories is beyond the scope of this study, a selection of the most relevant contributions is presented in the next section. Theories of good governance, common-pool resource governance, interactive (or socio-political) governance and collaborative governance are evaluated within the context of the resource conflict the governance of transboundary marine ecosystems.

2.5.1.1 Theories of good governance

For some scholars, the concept of 'good governance' is one of the most critical factors in enabling or undermining the effectiveness of environmental management (Bennett and Saterfield, 2018; Armitage et al., 2012; Lockwood, 2010; Lockwood et al., 2010; 2009; Ostrom; 1999; 1990). The used of the term good governance originated in the field of economic development and was later adopted by the OECD (Organisation for Economic Cooperation and Development) (Van Kersbergen and Van Waarden, 2004). The usage emphasised the political, administrative and economic values of greater transparency, accountability legitimacy and efficiency (Scholte et al., 2011; Woods, 2000).

Good environmental governance frameworks are largely based upon normative concerns. Principles can serve as ideological guidelines for applying governance approaches. Theoretical discussions in the environmental governance literature have centred around the following core principles: transparency, participation, accountability, adaptability (e.g. Schoon and Cox, 2018; Armitage and Plumber, 2012; Lockwood, 2010; Lockwood et al., 2010; Armitage et al., 2009; Badenoch, 2002).

Transparency signifies operational openness or visibility of the decision-making processes. For example, are stakeholders provided with 'reliable and timely information concerning operational policies and procedures' or 'access to information concerning environmental status and trends, and the potential environmental impacts of projects? (Badenoch, 2002:15). The principle of participation requires institutions to actively involve all stakeholders representing

diverse interests and sectors (i.e. government, industry, the research community and civil society) (Schoon and Cox, 2018) Within a transboundary context, this would mean the participation stakeholders from two or more jurisdictions. Transboundary participation is a critical component in effectively dealing with resource conflicts in contested ecosystems.

Accountability refers to the existence of mechanisms to hold an institution accountable in order to ensure they are subject to public scrutiny and responsive to affected stakeholders (Bennett and Satterfield, 2017; Secco et al. 2014; Lockwood, 2010; Lockwood et al., 2010). Adaptability refers to the need to be flexible and capable of adapting to changing circumstances in the face of current or projected uncertainty (Armitage et al., 2012; Armitage and Plummer, 2012; Lockwood et al., 2010; Plummer and Armitage, 2010; Armitage et al., 2009;). However, the existing body of literature dedicated to these core principles is silent in terms of policies to deal with resource conflict between stakeholders or states.

A concept linked to the principle of adaptability is that of planning for and managing uncertainty. Uncertainty has been categorised in different ways depending on its complexity (Salwasser, 2002). According to Tickner et al. (1999), parameter uncertainty refers to missing or ambiguous information (i.e. we do not know, but we can learn). These information gaps can be addressed by gathering and data (or more appropriate data) or refining the way in which the data is analysed. Model or structural uncertainty relates to gaps in scientific theory (i.e. we cannot know until it happens) (Cheung et al., 2016). Systemic uncertainty applies to information that has ubiquitous impacts (i.e. we do not know, what we do not know).

A review of the 'good governance' literature specific to the field of marine governance revealed that the three principles discussed above have been extended further by several scholars to include additional guiding rules. Table 2.5 presents examples of good governance principles adapted by five authors for different (but interconnected) marine contexts; high seas governance (Freestone, 2019); global ocean governance (Pyć, 2016); marine governance (Soma et al., 2015); sustainable

governance of the ocean (Costanza et al., 1999; 1998); conservation of wild living resources (Mangel et al., 1996 based on Holt and Talbot, 1978). A common set of additional marine principles emerged from this review which fall under three broad categories: science-based approach (i.e. ecosystem approach, precautionary approach); international/regional cooperation and coordination; adaptive management. Interestingly, there was also no explicit mention of conflict resolution mechanisms in any of these publications.

Table 2.5 Principles of Marine Governance[9]

High Seas Governance (Freestone, 2019)	**Global Ocean Governance** (Pyć, 2016)	**Principles for Marine Governance** (Soma et al., 2015)	**Sustainable Governance of the Oceans** (Costanza et al., 1999)	**Principles for the Conservation of Wild Living Resources** (Mangel et al., 1996 based on Holt and Talbot, 1978)
Conditional freedom of the seas[10] (Article 87, LOSC)	Agreed rules and procedures of coordination and cooperation	Accountability in decision-making	Responsibility	Maintenance of healthy populations of wild living resources in perpetuity is inconsistent with unlimited growth of human consumption of and demand for those resources.
Protection and preservation of the marine environment	Holistic, ecosystem and precautionary approaches	Legitimacy of inputs, outputs, process and feedback	Scale-matching	Secure present and future options by maintaining biological diversity at genetic, species, population, and ecosystem levels as a general rule neither the resource nor other components of the ecosystem should be perturbed beyond natural boundaries of variation.
International cooperation	Sustainable development	Responsibility for collective goals and solving sustainability problems	Precaution	Assessment of the possible ecological and sociological effects of resource use should precede both proposed use and proposed restriction or expansion of ongoing use of a resource.

[9] These principles vary according to their respective maritime jurisdictional zone given that sovereignty rights and responsibilities vary according to these different zones (as discussed in Section 2.3.1).

[10] Relating to navigation, overflight, submarine cables and pipelines, construction of artificial islands and installations, fishing scientific research.

Science-based approach to management	Regional action		Adaptive management	Regulation of the use of living resources must be based on understanding the structure and dynamics of the ecosystem of which the resource is a part and must take into account the ecological and sociological influences that directly and indirectly affect resource use.
Precautionary Approach	Participation of all stakeholders that have a role in ocean management		Full cost allocation	The full range of knowledge and skills from the natural and social sciences must be brought to bear on conservation problems.
Ecosystem Approach	Integrated management		Participation	Understanding and taking account of the motives, interests, and values of all users and stakeholders, but not by simply averaging their positions.
Sustainable and equitable use				Communication that is interactive, reciprocal, and continuous.
Public availability of information				
Transparent and open decision-making				
Responsibility of states as stewards of the global marine environment				

2.5.1.2 Theories of common-pool resource governance

Common-pool resources are composed of resource systems and a flow of resource units or benefits from these ecosystems (Ostrom, 2003). Examples of typical common pool resource systems include lakes, rivers, groundwater basins, and fishery stocks. Effective common pool resource governance regimes are dependent on the regulation and enforcement of rules pertaining to access and the amount, timing, and technology used to extract resources units from the ecosystem (Ostrom, 1990).

Theoretical debates on the sustainable management of common pool resources have primarily been motivated by Hardin's (1968) 'Tragedy of the Commons' thesis; the 'problem of sustaining a public resource that everybody is free to over-use' (Milinski et al., 2002: 424). Hardin's seminal work predicted that over-exploitation of collectively used natural resources will inevitably result in the eventual degradation of ecosystems (Feeny et al., 1990). 'A free-rider is an individual who chooses to receive a higher pay-off for a socially defecting choice than for a cooperative choice, even though all individuals will get a higher pay-off if they cooperate' (Steins and Edwards, 1999: 541 based on Hardin, 1968; Olson, 1965). The concept of collective action is thus central to theories of common pool resource governance.

However, the debate about collective action in this field has been obscured by Hardin's use of the term 'commons' to describe an open access regime. Within the context of the marine environment, Hardin also failed to consider the extensive debates and pioneering developments on addressing the 'dilemma of the ocean commons' such as LOSC which pre-dated his thesis (Scheiber, 2018).

It is therefore not surprising that in the last five decades, Hardin's theory has been the subject of much criticism (e.g. Brinkley 2020; Scheiber, 2018; Cox et al., 2016; Ostrom, 2002; 1999; McCay and Acheson, 1987). Dietz et al. (2002:3) provided a concise summation of the abundant counter-arguments: 'human motivation is complex, the rules governing real commons do not always permit free access to

everyone, and the resource systems themselves have dynamics that influence their response to human use'.

According to Steins and Edwards (1999), much of the earlier studies on the analysis of common pool resource governance concentrated on single resources (such as fisheries) subject to extraction by one distinct type of stakeholder (Singh, 1994; Bromley, 1992; Ostrom, 1990). Since then the literature has evolved significantly. Theories of common pool resources now encompass multiple resources that (i) are collectively used by multiple stakeholders and/or multiple stakeholder groups representing different sectors; (ii) for which, joint use of the resources by different sectors involves 'subtractability' whereby extraction by one stakeholder will subtract benefits from another stakeholder; and (iii) from an ecosystem that is difficult to exclude stakeholders (Steins and Edwards, 1999: 242)

In order to overcome the challenges associated with governing shared resources, Ostrom (1990) argued that successful common pool resource governance regimes exhibit eight design principles (Table 2.6). These principles were largely considered to be essential requirements for successful collective action in common pool resource theory (Hanna et al., 1995). Although Ostrom (1995: 43) stressed that 'there is no blueprint that can be used to create effective local institutions', some authors (Quinn et al. 2007) have argued that Ostrom's (1990) theory is not a panacea for successful common pool resource governance. It is clear that different common pool resource governance regimes are required for different contexts and different resource problems (Stevenson, 2017). Within the marine environment, due to the complexity and dynamics of social-ecological systems, there is no all-purpose, one size fits all solution to resource issues. Nevertheless, several studies have demonstrated that these principles are a useful analytical framework to explore the capacity of natural resource governance structures for sustainable governance in different socio-ecological settings (Tenzing et al., 2018; Le Tourneau and Beaufort, 2017; Baggio et al., 2016; McGinnis, 2011).

Table 2.6: Principles of (or requirements for) successful common pool resource governance regimes (Adapted from Tenzing et al., 2018 based on Ostrom, 1990)

1: Clearly defined boundaries	The physical boundary of the natural resources along with a list of eligible and authorised users should be clearly defined.
2: Congruence between the environment and the governance structures	Those who derive benefits from use of natural resources should concomitantly contribute towards provisioning and maintenance activities. Such interventions should be tailored to local conditions to ensure long-term sustainability.
3: Collective-choice arrangements	Stakeholders that depend on the natural resource should actively participate in decision-making processes.
4: Monitoring and evaluation	Monitoring and evaluation is vital to deter potential non-compliance by defaulters.
5: Graduated sanctions	All defaulters must be penalised for non-compliance and penalty increased according to the severity of the offence.
6: Conflict resolution mechanisms	Mechanisms must exist in order that conflicts can be resolved quickly, cheaply and fairly.
7: Minimal recognition of rights to organise	Natural resource users must be given some degree of freedom and flexibility to organise themselves to enhance relevance, applicability of rules and norms
8: Multi-layered nested framework	For larger resource systems, rules are embedded and enforced within a multi-layered nested framework for easy coordination, networking and being responsive to specific situations

A number of these principles resonate with the study of resource conflicts in contested ecosystems and can be applied to the case studies. Two of these are especially prominent: (i) establishing clearly defined physical boundaries of a resource system and stakeholder rights for successful natural resource management are clearly problematic in contested ecosystems experiencing resource conflicts; and (ii) unlike the environmental and marine governance principles previously discussed,

Ostrom's (1990) theory of common pool resource explicitly states that institutional arrangements should have low-cost local mechanisms to resolve conflicts between resource users quickly and effectively.

2.5.1.3 Theories of interactive governance

Interactive governance or 'socio-political governance' (Kooiman, 2002; 1999) is defined as 'the whole of interactions taken to solve societal problems to create societal opportunities; including the formulation and application of principles guiding those interactions and care for institutions that enable and control them' (Kooiman and Bavinck, 2005: 17). The interactions in question are those that occur between stakeholders representing the different governance domains (i.e. government, industry, research community and civil society).

Interactive governance theory argues that the physical and human elements of coastal and fisheries ecosystems (i.e. socio-ecological systems) are inherently complex, dynamic and diverse (Chuenpagdee and Jentoft, 2009). The primary challenge faced by governments is that the governance system must be compatible with the unique socio-ecological system-to-be-governed and also capable of responding to natural and anthropogenic changes (Jentoft and Chuenpagdee 2015; Scollick, 2016; Scholtens, 2015; Chuenpagdee 2011; Kooiman et al., 2008).

Interactive governance theory provides an inter-disciplinary and multi-perspective lens through which governance challenges can be systematically examined (Kooiman et al. 2008). Chuenpagdee and Jentoft (2013; 2009) developed a governability assessment framework based on Kooiman's earlier work (2008; 2002) on interactive governance theory. Governability is defined as the 'overall capacity for governance of any societal entity or system (Kooiman et al., 2008; 3). The interactive approach presupposes that the governability of a system is not static and constantly in flux in response to external and internal factors (Kooiman and Chuepengadee, 2005).

According to Chuenpagdee and Jentoft (2013), 'three orders' (or analytical levels) of governance are differentiated: meta-governance (i.e. norms, principles and values

that guide institutions and actions); second-order governance (i.e. the design of the institutional arrangements that frame and facilitate the actions); and first-order governance (routine day-to-day management and decision-making processes to address problems). These orders of governance are inexorably shaped by issues of scale (i.e. system boundaries), complexity, diversity and dynamics of the system mentioned previously.

The initial steps in the governability assessment involve the analysis of the problems (e.g. the resource conflict), the degree and nature of their complexity (or wickedness), and the ways in which these problems are viewed and framed by stakeholders. Resource conflicts involving the governance of fisheries and aquaculture can be viewed from multiple perspectives. Stakeholders may perceive problems and conflicts in different ways and disagree on the root causes according to their respective world view and agenda (Song et al., 2013; Chuenpagdee and Jentoft, 2013). In addition, they can be embedded in broader societal or political issues (Scholtens, 2016a; 2015; Bavinck et al., 2014). Importantly for this thesis, these factors invariably influence the types of solutions that will be acceptable to all.

The next step is a systematic analysis of three contextual variables: (i) the natural and human properties of the socio-ecological system-to-be governed (i.e. the marine ecosystem; stakeholders from all governance domains), (ii) the capacity of the existing governance system (i.e. institutions and mechanism to deal with issues), and (iii) the governing interactions (e.g. the flow of information, degree of stakeholder participation, and the role of power relations) (Chuenpagdee and Jentoft, 2013). Recognising the fundamental differences between these three systems is vital when developing governance strategies (Karlsson and Gilek, 2019; Jentoft and Chuenpagdee, 2015).

According to Jentoft et al. (2007:613), governability is the 'outcome of any socio-political process that may break one way or another, depending on the relative bargaining power of stakeholder groups, individually or by coalition, at a particular point in time'. The assessment (or suitability) of the governance system is based on

the analysis of the three orders of governance against the following criteria: appropriateness of the fit (e.g. institutions, actions); adaptiveness and responsiveness to change and uncertainty (e.g. presence of conflict); and performance in addressing challenges (Chuenpagdee and Jentoft, 2013).

The final step of the governability assessment focuses on the governing interactions analysis and involves the institutions and processes through which the socio-ecological system and the existing governance system relate to each other (Kooiman et al., 2008). Power relations are central to governing interactions and have the ability to enable and restrict the distribution of power between stakeholders. This component of the assessment therefore examines how some stakeholders are more powerful than other and are 'capable of influencing the governing system to serve their own interest' (e.g. operating in an area/jurisdiction without authorisation, extracting a resource without a relevant license). An imbalance of power amongst stakeholders can reduce the overall capacity of the governance system to address the basic concerns of the socio-ecological system (Chuenpagdee and Jentoft, 2013) and potentially activate the emergence and escalation of resource conflicts.

The interactive governance framework has been applied to the governance of several marine resources to contextually analyse issues, challenges and concerns (including resource conflicts) that undermine the long-term sustainability of ecosystems. Examples include capture fisheries and aquaculture (Scholtens, 2016a; 2015; Song et al., 2013; Scholtens and Bavinck, 2013; Chuenpagdee et al. 2008; Bavinck and Salagrama, 2008; Kooiman and Bavinck., 2005; Bavinck et al., 2005), coastal and marine governance (Jentoft and Chuenpagdee, 2009) marine conservation (Chuenpagdee, 2011), marine protected areas (Pascual-Fernández, 2015; De la Cruz Modino, 2013; 2005; Jentoft et al., 2012; 2007).

Table 2.7: Governability assessment framework for coastal and marine ecosystems (adapted for resource conflicts by the author and based on Chuenpagdee and Jentoft, 2013:18; Chuenpagdee and Jentoft, 2009; Kooiman et al., 2008).

Step	Assessment description	Targets	Characteristics	Variables
1	Analysis of the nature and degree of complexity of the problem (e.g. resource conflict) and the ways in which it is perceived by relevant stakeholders.	Resource conflict	Degree of complexity	Stakeholder perspectives; Existence of stopping rules; Embedded nature of the problem; Cost and reversibility of prescribed solutions.
2	Systematic assessment of how the characteristics of the socio-ecological system can contribute to hindering or enhancing governability in particular situations.	Socio-ecological system-to-be-governed; Governance system; Governing interactions.	Diversity; complexity; dynamics; scale.	Components; Relationships; Interactions; Boundaries.
3	Assessment of what drives the governance system; how suitable each part of the system is to responds to the resource conflict; and how the different orders of governance inhibit or foster desirable outcomes for the socio-ecological system.	Governance system	Compatibility of governance institutions and actions; (Responsiveness of governance models (top-down, co-management, bottom-up); Performance of governance orders (i.e. first, second and meta).	Institutional arrangements, Behaviour and decisions; Awareness, sensitivity to change and uncertainty; Intensity of conflicts.
4	Examination of the factors affecting various interactions and the degree to which these interactions are conducive to good governance.	Governing interactions	Presence and quality of interactions; Enabling and disabling role of power relations.	Information sharing, adaptiveness; Participation, inclusiveness, representativeness.

According to Jentoft et al. (2007:613), governability is ultimately the 'outcome of any socio-political process that may break one way or another, depending on the relative bargaining power of stakeholder groups, individually or by coalition, at a particular point in time'. Assessing governability (e.g. in a contested marine ecosystem) is part of a 'reality check that governors must engage in to improve effectiveness' (Chuenpagdee and Jentoft, 2009). Assessing the governability of contested marine

ecosystem shared by two jurisdictions will inevitability be more challenging as it involves two sets of socio-ecological systems to-be governed, governance systems and governance interactions. However, Chuenpagdee and Jentoft's (2013) governability assessment framework offers a holistic lens to examine these three elements at local, national and transboundary scales. Table 2.7 summarises the key steps, targets, characteristics and variables involved in assessing governability. This structured analysis can contribute to enhanced understanding of the unique socio-political and environmental governance challenges linked to addressing resource conflicts in the Lough Foyle and Palk Bay ecosystems.

2.5.1.4 Theories of collaborative governance

A considerable body of knowledge discussing collaborative (or participatory) governance has emerged in recent decades. In this thesis, collaborative governance can be regarded as an umbrella term for a 'governing arrangement where one or more public agencies directly engages non-state stakeholders in a collective decision-making process that is formal, consensus-oriented and deliberative' (Ansell & Gash, 2008:2). One of the key characteristics of this type of governance is that it requires working across boundaries (i.e. the different governance domains) through the participation of stakeholders to solved shared problems that could not be otherwise fulfilled individually (Emerson and Nabatchi, 2015).

It is important to highlight that a host of similar terms are used interchangeably throughout the literature: participatory governance (Friedrich et al., 2020; Lovan et al., 2017; Kearney et al., 2017; collaborative public management (Eriksson et al., 2020; Amsler and O'Leary, 2017; O'Leary & Vij, 2012; Agranoff and McGuire, 2004), collaborative decision-making (Semanjski and Gautama, 2019; Evers et al., 2016); and network governance (Nochta and Skelcher, 2020; Lubell et al., 2017; Sørensen and Torfing, 2016; Weber and Khademian, 2008).

According to Bodin (2017), environmental governance, by its very nature, requires collaboration by stakeholders. One aspect of managing ecosystems that is becoming increasingly problematic is the human dimension challenge of high numbers and

expanding diversity of stakeholders competing for limited marine space (Christie et al., 2017). Collaborative governance is frequently argued as the preferred means of addressing environmental problems (Robinson et al., 2020; Rodela and Swartling, 2019) and particularly in terms of natural resource conflict management (Fisher et al., 2020; Thomas and Mendezona Allegretti, 2019; Emerson et al., 2017).

Collaborative governance is initiated and evolves within a multi-layered context of different pre-existing conditions and influences; political, legal, socio-economic, cultural environmental (and geopolitical within a transboundary context) (Emerson et al., 2012; Borrini-Feyerabend, 1996). These contextual factors can either enable or discourage collaboration among stakeholders (Ansell and Gash 2008). In addition, Gray and Purdy's (2018) typology of motivation for collaborative processes differentiates two contexts; those that emerge as a result of conflict, and those that are established with a shared vision. The way in which these processes are instigated inherently influences their composition and their collaborative dynamics over time (Emerson et al., 2012).

Emerson and Nabatchi (2015) developed an alternative typology based on formative types that relates to how stakeholders mobilise to form and direct a collaborative governance mechanism. They identified three formative types; self-initiated, independently convened, and externally directed. Self-initiated mechanisms are internally generated and centred on common interests and shared motivation. Leadership is key to sustaining the momentum for joint action. Those that are independently convened are facilitated by a neutral third party and develop over time through demonstration of good-faith participation. A history of conflict often compels the creation of an independent leader or lead institution. Knowledge is the key initial element in the capacity for joint action. Externally directed collaborative mechanisms often establish the formal structure that controls what stakeholders can participate and the way in which they can participate. It is constrained or enabled by pre-determined terms and trust is leverage rather than created. Stakeholder buy-in will likely take time and is influenced by different factors such as the degree of

transparency, balance in representation, accountability and adaptability (i.e. principles of good governance) of the pre-determined collaborative structure.

Theories of collaborative governance are not certainly without criticism. Shellenberger and Nordhaus (2009) argued that collaborative processes can perpetuate existing asymmetries of power among the stakeholders. This imbalance in power can lead to 'governance inertia and inhibit effective measures for dealing with environmental problems' (Bodin, 2017: 1; Fischer, 2014) Other authors have reported that collaborative governance can exacerbate conflict, or allow special interest groups to bias outcomes (Scott 2015; Gerrits and Edelenbos, 2004; Cooke and Kothari, 2001). In response to these concerns, there is growing evidence that if well designed, many benefits can be achieved through the collaboration of stakeholders in environmental management decision-making processes (Bodin, 2017; Bodin et al., 2016; Guerrero et al., 2015; Rosenbloom and Gony, 2013; Newig and Fritsch, 2009; Reed, 2008; Santos et al., 2006).

According to one of the most cited authors in the field (Reed, 2008), the quality of decisions made through a collaborative governance mechanism is primarily shaped by the nature of the process leading to them. He identified eight features of best practice participation through a Grounded Theory analysis of extensive literature from different disciplinary and geographical contexts: (i) collaborative governance needs to be underpinned by a philosophy that emphasise empowerment, equity, trust and learning; (ii) where relevant, stakeholder participation should be considered as early as possible and throughout the process; (iii) relevant stakeholders need to be analysed and represented systematically; (iv) clear objectives for the collaborative process need to be agreed among stakeholders at the outset; (v) methods should be selected and tailored to the decision-making context, considering the objectives, type of participants and appropriate level of engagement; highly skilled facilitation is essential; local and scientific knowledge should be integrated; participation needs to be institutionalised.

More recently, based on Reed's (2008) seminal work, De Vente et al. (2016) proposed some additional good practice principles to prevent power imbalances between stakeholders. These include providing participants with information to make informed decisions making power, promoting long-term commitment; and adapting the language and location to suit the participants and the local context. Combined, these principles provide a useful framework to analyse existing collaborative mechanisms in the case studies and as a foundation to propose more effective structures going forward. However, they both neglect the topic of conflict resolution between stakeholders.

Prabhu et al. (1999) defined a good practice principle as a fundamental truth on which to base action, and criteria as a second-order principle which adds further meaning and operational potential. Building on these concepts, Lim (2014b) developed a set of good practice criteria to guide the effective governance of transboundary water resources and terrestrial biodiversity which include; (i) the involvement of stakeholders at each political level; (ii) political buy-in exists; (iii) equitable distribution of costs and benefits; (iv) an integrated approach that incorporates clear objectives and best-available science is applied; (v) good governance is practised; (vi) adaptive managements including a system for monitoring and evaluation; (vii) existence of rules and legal instruments that enable the process; (viii) designated institutions at the appropriate scales with vertical and horizontal linkages are established; (ix) long-term funding and adequate resources are secured; and (x) a dispute resolution mechanism exists. These criteria are transferable to the marine domain and provide a diagnostic framework to evaluate current transboundary governance arrangements in the case studies.

2.5.2 Moving from theory to practice: Operationalising governance through marine ecosystem-based management

The terms EA and EBM are often used interchangeably in the literature and they broadly mean the same thing (Agardy, 2011). The movement to adopt these strategies has been underway for some time and the following section reviews a selection of the most relevant developments in the field.

2.5.2.1 The Ecosystem Approach (EA)

The EA is embedded in the concept of sustainable development, which in essence requires that the needs of future generations are not compromised by current human activities (Holden et al., 2017). In terms of definitions, the Convention on Biological Diversity (CBD) defines an ecosystem as an 'interacting complex of living communities and the environment, functioning as a largely self-sustaining unit'. Humans are an intrinsic part of ecosystems. The EA is "a strategy for the integrated management of land, water, and living resources that promotes conservation and sustainable use in an equitable way" by humans (CBD, 200 decision V/6, annex, section A, para. 111). According to the CBD, the EA can be achieved through the application of 12 complementary and interlinked principles; the Malawi Principles (Table 2.8).

According to Shepherd (2008:5), the Malawi principles are listed in an arbitrary manner and he re-grouped them by thematic steps in a broad chronological order to enhance their usefulness:

1. Stakeholders: Principle 1 and 12.
2. Area: Principle 7, 11 and 12.
3. Ecosystem structure, function, and management: 5, 6, 10, 2.
4. Economic issues: Principle 4.
5. Adaptive management over space: Principle 3 and 7.
6. Adaptive management over time: Principle 7, 8, 9.

[11] https://www.cbd.int/decision/cop/?id=7148

Table 2.8: The 12 Malawi Principles of the Ecosystem Approach

	Principle	Rationale
1.	**The objectives of management of land, water and living resources are a matter of societal choice.**	Different sectors of society view ecosystems in terms of their own economic, cultural and societal needs. Indigenous peoples and other local communities living on the land are important stakeholders and their rights and interests should be recognized. Both cultural and biological diversity are central components of the ecosystem approach, and management should take this into account. Societal choices should be expressed as clearly as possible. Ecosystems should be managed for their intrinsic values and for the tangible or intangible benefits for humans, in a fair and equitable way.
2.	**Management should be decentralized to the lowest appropriate level.**	Decentralized systems may lead to greater efficiency, effectiveness and equity. Management should involve all stakeholders and balance local interests with the wider public interest. The closer management is to the ecosystem, the greater the responsibility, ownership, accountability, participation, and use of local knowledge.
3.	**Ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems.**	Management interventions in ecosystems often have unknown or unpredictable effects on other ecosystems; therefore, possible impacts need careful consideration and analysis. This may require new arrangements or ways of organization for institutions involved in decision-making to make, if necessary, appropriate compromises.
4.	**Recognizing potential gains from management, there is usually a need to understand and manage the ecosystem in an economic context. Any such ecosystem-management programme should: (a) Reduce those market distortions that adversely affect biological diversity; (b) Align incentives to promote biodiversity conservation and sustainable use;(c) Internalize costs and benefits in the given ecosystem to the extent feasible.**	The greatest threat to biological diversity lies in its replacement by alternative systems of land use. This often arises through market distortions, which undervalue natural systems and populations and provide perverse incentives and subsidies to favour the conversion of land to less diverse systems. Often those who benefit from conservation do not pay the costs associated with conservation and, similarly, those who generate environmental costs (e.g. pollution) escape responsibility. Alignment of incentives allows those who control the resource to benefit and ensures that those who generate environmental costs will pay.

5.	**Conservation of ecosystem structure and functioning, in order to maintain ecosystem services, should be a priority target of the ecosystem approach.**	Ecosystem functioning and resilience depends on a dynamic relationship within species, among species and between species and their abiotic environment, as well as the physical and chemical interactions within the environment. The conservation and, where appropriate, restoration of these interactions and processes is of greater significance for the long-term maintenance of biological diversity than simply protection of species.
6.	**Ecosystems must be managed within the limits of their functioning.**	In considering the likelihood or ease of attaining the management objectives, attention should be given to the environmental conditions that limit natural productivity, ecosystem structure, functioning and diversity. The limits to ecosystem functioning may be affected to different degrees by temporary, unpredictable or artificially maintained conditions and, accordingly, management should be appropriately cautious.
7.	**The ecosystem approach should be undertaken at the appropriate spatial and temporal scales.**	The approach should be bounded by spatial and temporal scales that are appropriate to the objectives. Boundaries for management will be defined operationally by users, managers, scientists and indigenous and local peoples. Connectivity between areas should be promoted where necessary. The ecosystem approach is based upon the hierarchical nature of biological diversity characterized by the interaction and integration of genes, species and ecosystems.
8.	**Recognizing the varying temporal scales and lag-effects that characterize ecosystem processes, objectives for ecosystem management should be set for the long term.**	Ecosystem processes are characterised by varying temporal scales and lag-effects. This inherently conflicts with the tendency of humans to favour short-term gains and immediate benefits over future ones.
9.	**Management must recognize that change is inevitable.**	Ecosystems change, including species composition and population abundance. Hence, management should adapt to the changes. Apart from their inherent dynamics of change, ecosystems are beset by a complex of uncertainties and potential "surprises" in the human, biological and environmental realms. Traditional disturbance regimes may be important for ecosystem structure and functioning and may need to be maintained or restored. The ecosystem approach must utilize

		adaptive management in order to anticipate and cater for such changes and events and should be cautious in making any decision that may foreclose options, but, at the same time, consider mitigating actions to cope with long-term changes such as climate change.
10.	**The ecosystem approach should seek the appropriate balance between, and integration of, conservation and use of biological diversity.**	Biological diversity is critical both for its intrinsic value and because of the key role it plays in providing the ecosystem and other services upon which we all ultimately depend. There has been a tendency in the past to manage components of biological diversity either as protected or non-protected. There is a need for a shift to more flexible situations, where conservation and use are seen in context and the full range of measures is applied in a continuum from strictly protected to human-made ecosystems.
11.	**The ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices.**	Information from all sources is critical to arriving at effective ecosystem management strategies. A much better knowledge of ecosystem functions and the impact of human use is desirable. All relevant information from any concerned area should be shared with all stakeholders and actors, taking into account, inter alia, any decision to be taken under Article 8(j) of the Convention on Biological Diversity. Assumptions behind proposed management decisions should be made explicit and checked against available knowledge and views of stakeholders.
12.	**The ecosystem approach should involve all relevant sectors of society and scientific disciplines.**	Most problems of biological-diversity management are complex, with many interactions, side-effects and implications, and therefore should involve the necessary expertise and stakeholders at the local, national, regional and international level, as appropriate.

Significantly for this study, the EA promotes sustainable use of resources, and rather than just focussing on a local jurisdiction, it requires neighbouring states and stakeholders to communicate and collaborate effectively (Oates and Dodds, 2017). However, an in-depth review of the application of the EA carried out by the CBD (2007) identified the following impediments for developing effective governance in

these contexts: (i) ineffective stakeholder participation in planning and management; (ii) limited understanding of what the approach seeks to achieve; (iii) lack of capacity for decentralised and integrated management; (iv) Insufficient institutional cooperation and capacity; (v) lack of dedicated organisations able to support delivery of EA; (vi) the overriding influence of perverse incentives; and (vii) conflicting political priorities, including those that arise when a more holistic approach to planning is adopted.

2.5.2.2 Ecosystem-based Management (EBM)

The argument that the environment should be managed in whole ecological units based on biological, physical and socio-economic assessment first emerged over half a century ago (Caldwell, 1970). He emphasised how 'artificial boundaries and restrictions that law and political economy impose' upon ecosystems negatively impact land-use policy (Caldwell, 1970: 203). Bases on these earlier theories, Slocombe (1993:612) argues that EBM (or the EA) was 'partly a matter of redefining management units and partly building on the best ecosystem science'.

EBM has gained increasing attention over the years and has been applied to diverse settings to address a wide range of environmental management challenges. Examples from different terrestrial and marine habitats include: forests (Sayer et al., 2013; Gamborg and Larsen, 2003; Noss, 1999; Kohm and Frankiln, 1997); estuaries (Boerema and Meire, 2017; Elliot and Whitfield, 2011; McLusky and Elliot, 2004; Hennessy, 1994; Imperial et al., 1993); lakes (Hartig, 2019; Guthrie et al., 2019; Guthrie, 2017; Hosper, 1998; Mackenzie, 1996) river-basins (Weiler et al., 2018; Gaspar et al., 2017; Dinar and Lee, 1999; Lee and Dinar, 1996; Lee, 1995; Constanza and Greer, 1995); fisheries (Goulding et al., 2019; Porobic et al., 2018; Smith et al., 2007; Marasco et al., 2007; Pope and Symes, 2000; Slocombe, 1998) and large marine ecosystems (Kirkman et al., 2016; Sutinen et al., 2006; Duda and Sherman, 2002; Sherman, 1995). Common themes in many of these studies is the need for collaborative decision-making and the integration of best available multi-disciplinary scientific data.

Despite an extensive body of literature dedicated to EBM and the EA, no universal definition has been accepted (Long et al., 2015) and this partly explains why there is ongoing ambiguity surrounding what constitutes EBM in practice (Link and Browman, 2017). According to De Lucia (2017), there are a plethora of international laws, policies and agreements calling for or necessitating EBM (e.g. CBD, LOSC, UN Sustainable Development Goals, OSPAR, FAO).

Based on a synthesis of the principles of EA presented in the previous section, Long et al. (2015: 59), defined EBM as:

> *'An interdisciplinary approach that balances ecological, social and governance principles at appropriate temporal and spatial scales in a distinct geographical area to achieve sustainable resource use. Scientific knowledge and effective monitoring are used to acknowledge the connections, integrity and biodiversity within an ecosystem along with its dynamic nature and associated uncertainties. EBM recognizes coupled social-ecological systems with stakeholders involved in an integrated and adaptive management process where decisions reflect societal choice'.*

2.5.2.3 Marine ecosystem-based management (MEBM)

In recent decades, EBM has emerged as the dominant paradigm for the integrated management of coastal and marine ecosystems across the globe (Alexander et al., 2019; O'Higgins et al., 2019; Long et al., 2015; Sardà et al., 2014; Olsen et al., 2009; Borja et al., 2008; Ruckelshaus et al., 2008). Whilst traditional, sectoral-based management focuses on specific species or resources (e.g. fisheries, oil and gas), MEBM deals with the human activities that have an impact on the ecosystem rather than a strategy to manage ecosystems themselves (Gavaris, 2009). This place-based strategy strives to 'address interactions and cumulative effects among multiple uses of marine ecosystem components; multiple impacts of most human activities, including land-based activities; and multiple policy instruments used to manage the uses (Rice et al., 2005: 273).

Following on from the earlier discussion of EA principles, Table 2.9 presents four examples of principles of MEBM that have been proposed by different authors essentially all adapted from the Malawi Principles[12]. An analysis of these various sources reveals that there are major overlaps between the principles of good practice in EA and MEBM (Kirkfeldt, 2019). Interestingly, the most recent principles (Rudd et al., 2018; Long et al., 2015) are more comprehensive (i.e. 15 and 14 principles respectively) compared to the older principles (Roxburgh et al., 2012; Arkema et al., 2006; Rice et al., 2005). It is feasible to deduce that the different variations indicate that theories of EBM have developed overtime possibly as a result of more lessons learned from an increasing number of practical examples of MEBM application. For this reason, it seems logical that the most current principles can serve as a benchmark to assess the effectiveness of real-life MEBM scenarios.

Within the context of this study, as outlined in several of the principles, collaborating with neighbouring countries, the active involvement of stakeholders; and the need to connect management strategies at multiple scales from local to transboundary are key components of MEBM. For some authors, the process of MEBM design and implementation is a gradual process involving a spectrum of EBM effort (Agardy et al., 2011). This can range from no or low EBM in practice (e.g. single sector or individual species management at local scales, short-term perspective year-to-year) to incremental EBM (e.g. managing groups of species or two sectors, coordinated management at different scales, medium-term perspective up to five-years), to comprehensive EBM (e.g. managing ecosystems holistically, coordinated managements at all levels and scales, long-term perspective up to 20-years) (Agardy et al. 2011: 12).

According to Rudd et al. (2018:1), EBM requires a significant 'degree of coordination across countries that share ocean ecosystems, and among national agencies and departments that have responsibilities relating to ocean health and marine resource

[12] The focus of this thesis is principally on integrated multi-sectoral approaches to marine governance (rather than single-sector strategies). However, it is worth noting that EBM principles have been developed and applied to the specific marine resources presented in the case studies: (chapter four) aquaculture (e.g. Brugère et al., 2019; 2010; Froehlich et al., 2017; Soto et al., 2007) and (chapter five) fisheries (e.g. Song et al., 2013; FAO, 2012).

utilization. This requires political direction, legal input, stakeholder consultation and engagement, and complex negotiations. An extensive body of literature has developed dedicated to practical examples of EBM at different stages and scales (e.g. local, national, transboundary) and different geographical and economic development contexts. Examples of transboundary strategies from shared marine regions in the Global North and South have been selected as part of this review as they are most pertinent to this study.

Table 2.9 Principles of Marine ecosystem-based management (MEBM)

Ocean Ecosystem- Based Management *(Rudd et al., 2018: Adapted from the Convention on Biological Diversity, 2004)*	**Marine Ecosystem-Based Management** (*Long et al., 2015)*	**Ecosystem Approach to Transboundary Marine Management** (*Roxburgh et al., 2012 adapted from the Convention on Biological Diversity, 2004)*	**Marine Ecosystem-Based management** *(Arkema et al., 2006)*	**ICES Principles for Ecosystem Approach to Marine Management** *(Rice et al. ,2005 adapted from the Convention on Biological Diversity, 2004*
The management of natural resources are a matter of societal choice.	Consider ecosystem connections.	Stakeholder role: stakeholders should adopt an active and committed role to achieve the common goal of the ecosystem approach and be involved in all aspects of management leading to a shared understanding of objectives.	Acknowledge linkages between ecosystem components.	Management should be based on a shared Vision and requires stakeholder engagement and participation.
Management should be devolved to the lowest appropriate level.	Appropriate spatial and temporal scales.	Balance: there should be a suitable balance between conservation and the sustainable use of resources in the interests of the health of the whole ecosystem	Incorporate temporal scales of ecosystem.	Planning and management should be integrated, strategic, adaptive, and supported by unambiguous objectives and take a long-term perspective.
Ecosystem managers should consider the effects (actual or potential) on adjacent or other ecosystems.	Adaptive management.	Evidence: an evidence-based system should be used to integrate social, environmental and economic interests	Recognise that different spatial scales that ecosystems operate within	The geographic span of management should reflect ecological characteristics and should enable management of the natural resources of both the marine and terrestrial components of the coastal zone.
Recognising potential games from management, there is usually a need to understand and manage the ecosystem in an economic, social and cultural context.	Use of scientific knowledge.	Adaptive: management should use an iterative and flexible approach.	Recognise that human use and value natural resources.	The management objectives should be consistent with the requirement for sustainable development and reflect societal choices. They should address the desired quality status of the structure and dynamic functions of the ecosystem.

Conservation of ecosystem structure and functioning should be an objective.	Integrated management.	Timescales: management should be set for the long-term with short- and medium-term objectives and milestones and should enable involvement of future stakeholders.	Integrate economic factors.	Management should be based upon the precautionary principle, the polluter-pays principle, and the prevention principle.
Ecosystem Approach should be undertaken at the appropriate spatial and temporal scale.	Stakeholder participation.	Economic sensitivity: involvement in implementing the ecosystem approach should not create an economic disadvantage but should promote responsible and sustainable behaviour.	Engage interested parties in the management planning processes to find common solutions.	Best Available Technologies (BAT) and Best Environmental Practices (BEP) should be applied.
Management must recognise that change is inevitable.	Account for dynamic nature of ecosystems, ecological integrity and biodiversity.	Subsidiarity: management should be undertaken by the smallest, lowest, or least-centralised competent authority.	Incorporate science-based evidence into management decisions.	Management should be supported by coordinated programmes for monitoring, assessment, implementation, and enforcement and by peer-reviewed scientific research and advice and should make the best use of existing scientific knowledge.
Seek the appropriate balance (trade-off) between and integration of, conservation and used of marine resources.	Sustainability	Connecting international through to local: local and sectoral strategies, plans and policies should be harmonised, and priorities established to reflect national and international goals and objectives for conservation and sustainable use.	Recognise that management plans must have spatially defined boundaries.	Apply the precautionary approach when threats are uncertain.
Consider all forms of scientific, indigenous and local knowledge, innovation and practices.	Recognise coupled socio-ecological systems.	Review and monitoring: an effective and targeted performance monitoring and review regime should be used to inform management	Use scientific and industrial technology as tools for ecosystem monitoring.	Use an interdisciplinary approach for management decisions.
Involves all relevant stakeholders (i.e. society and science).	Decisions reflect societal choice.	Adjacent impacts: consideration should be given to how events or actions in marine ecosystems can influence or be influenced by events	Employ adaptive management techniques to continually evaluate and improve management actions.	Monitor and track ecosystem changes for management purposes.

		or actions on the land, in the air or in different parts of the ocean.		
Recognise the interdependence between human wellbeing and ecosystems.	Distinct boundaries.	Involve and inform: management should involve and inform all relevant sectors of society and scientific disciplines	Promote shared responsibility through co-management with government and stakeholders.	
Adoption and utilisation of an appropriate policy, legal and institutional framework to support sustainable use of resources.	Inter-disciplinarity			
Objectives are reconciled through prioritisation of trade-offs.	Appropriate monitoring			
Maintaining ecosystem productivity for present and future generations.	Acknowledge uncertainty			
Establish and preserve equity in all forms (inter-generational, intra-generational, cross-sectoral, transboundary and cross-cultural).				

From a Global South perspective, Christie et al. (2009) presented a comparative analysis of EBM success in the tropics (Caribbean and Philippines) and the Benguela Current Large Marine Ecosystem (BCLME) in south-west Africa. Existing resource management regimes in these regions are embedded in a colonial history often characterised by a legacy of impoverished societies with large disparities between the rich and poor. For this reason, generally large-scale, expensive and science-dependent ocean governance initiatives (from the Global North) are not conducive to these contexts and almost certainly fail (Christie et al. 2009). Despite these conditions, Christie et al. (2009:383) argued that EBM could potentially be 'implemented in a manner that is attentive to critical contextual conditions and governance processes' including the establishment of a context-appropriate conflict resolution mechanism.

In a recent special issue, Sherman et al. (2019) highlighted recent progress in the development of EBM in 13 Asian LMEs with a surrounding population of three billion people. Critical concerns that urgently need to be addresses in these major geographical ecosystems include over-fishing, eutrophication, pollution, habitat degradation, biodiversity loss and climate change. The International Waters Programmed of the Global Environmental Facility (GEF) has facilitated many economically developing nations towards the sustainable development of shared seas to help meet the objectives of international environmental conventions and agreements. Elayaperumal et al. (2019) described the progress to-date of the GEF-funded EBM project activities in the Bay of Bengal LME (BOBLME). The Palk Bay ecosystem (presented in chapter 5) is nested within the wider BOBLME.

The BOBLME is one of the largest LMEs globally and is shared by eight diverse countries: Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka and Thailand. With a combined population of over 2 billion, the coastal population dependent on the coastal and marine resources exceeds 185 million, and over 3.7 million are directly employed in fisheries (FAO, 2018). The BOBLME project aimed to be the foundational phase of an 'effective, efficient, appropriate and long-term

mechanism for collaborative regional management' at the LME scale with a requirement for each 'country's institutions to have the capacities to commit to and participate in the collaborative mechanism'. The initial steps of transitioning to EBM across the region began over a decade ago and the Transboundary Diagnostic Analysis (TDA) identified and prioritised the major transboundary environmental concerns over-exploitation of living resources, IUU fishing, marine pollution, water quality, habitat degradation, biodiversity loss and climate change (BOBLME, 2012).

Whilst these BOBLME countries 'vary considerably in their governance arrangements and capacity to implement, they recognise the importance of regional coordination and cooperation to address transboundary issues' (Elayaperumal et al., 2019: 87). Despite this awareness, one of the main criticisms of the project has been the over-riding focus on fisheries and a lack of interaction with other sectors across the region, particularly the environment sector. (FAO, 2016). Major capacity gaps prevailing in the eight countries have also been reported as barriers to progress of a BOBLME-wide EBM approach including: (i) weak implementation and enforcement of inappropriate policies, strategies and legal measures; (ii) lack of alternative livelihoods; (iii) weak institutional capacity; (iv) insufficient budgetary commitments; and (v) lack of community stakeholder consultation and empowerment (FAO, 2016:14). In terms of lessons learned, national actions are considered 'an essential foundation upon which additional benefits may be gained from concerted and collaborative actions between countries. The overemphasis on establishing regional institutional arrangements has resulted in insufficient attention to national and local capacities.

Over the past 20 years, Marine or Maritime Spatial Planning (MSP) has been heralded as an essential tool for delivering the MEBM (Gissi et al., 2019). Indeed, several authors have chosen to refer to this process as 'Ecosystem-based MSP' (Manea et al., 2020; Pınarbaşı et al., 2019; Ansong et al., 2017; Gilliland and Laffoley, 2008) to emphasise that fact that MSP is an instrument for operationalising EBM in our seas. MSP is currently 'under development in over 66 countries (44% of the nations with

marine waters), encompassing six continents and four ocean basins' (Santos et al., 2019: 571)

MSP is a socio-political process that aims to coordinate (i) the use of marine space, (ii) the sectoral interactions between traditional and newly emerging industries (e.g., fisheries, aquaculture, shipping, tourism, renewable energy production) and (iii), between marine users and the marine environment (Ehler and Douvere, 2009; Ehler and Douvere, 2009). However, there is no universally agreed definition and this reflects the different contexts under which MSP has been developed (e.g. Europe, North America, Africa), the scope it can take (e.g. conservation, economic development), and the diverse range of applications it has. One of the first (and most cited) definitions is:

> *'The rational organisation of the use of marine space and the interactions between its uses, to balance demands for development with the need to protect the environment, and to achieve social and economic objectives in an open and planned way' (Douvere, 2008: 766).*

A recent review of MSP literature identified over 900 scientific papers on MSP published in international peer-reviewed journals and almost 10,000 articles in Google Scholar when searching for "marine spatial planning" alone (Santos et al., 2019). A comprehensive review of MSP is therefore beyond the scope of this study (see Trouillet, 2020; Ehler et al., 2019 or Santos et al., 2019 for the most recent reviews). The focus here is a brief overview of the literature relating to recent development of transboundary MSP approaches in different geographical and economic development contexts.

Several scholars have argued that MSP has merits in terms of conflict management. Maes (2008) argued that MSP could address the conflict associated with the spatial extension of ongoing sea uses and between stakeholders by allocating space for specific uses to improve the management of marine spatial claims. For Taffon (2019:5), MSP is 'conceived as a problem-solving regimen to govern the use and

protection of marine resources' and 'extolled as an effective means to reach consensus among various stakeholders with diverse world views, interests, values and powers. Furthermore, it is 'envisioned as a conflict-mitigating process which allocates space in a rational manner and minimizes conflict of interests and where possible maximizes synergies amongst sectors' (Ehler and Douvere, 2006: 13 cited in Josse et al., 2019:6).

As part of the MSP process, the delineation of maritime boundaries is fundamental and most often defined by political and jurisdictional borders, which typically do not correspond to the limits of ecosystems. In this context, transboundary cooperation and collaboration across jurisdictions is essential to increase the effectiveness of planning for the EBM of coastal and marine resources (European Union, 2017). Many authors have argued that effective MSP can only be defined within the specific context in which it is practiced and similar to other governance approaches, there is no one-size fits all recipe for success (Twomey and O'Mahony, 2019; O'Higgins et al., 2019; Papageorgiou and Kyvelou, 2018; van Tatenhove, 2017; Jay et al., 2016; Flannery et al., 2015;).

Existing good practice principles that encourage transboundary collaboration in MSP are mostly based on EA principles and include the following: (i) 'invest in a deep understanding of the existing governance system; (ii) invest time and resources during the MSP processes in building trust and a sense of common purpose among all parties involved; (iii) adopt an issue-driven approach to MSP; (iv) adopt a long-term perspective; (v) manage expectations for stakeholder involvement; (vi) design monitoring and evaluation system that analyses program performance, learning and progress towards goals over the long-term' (European Union, 2017: 48; Jay et al., 2016; Almodovar et al., 2014).

Although MSP has primarily been applied at a national level, there is a growing recognition of the imperative to cooperate across jurisdictional boundaries to ensure effective EBM is implemented in both the Global North (Ritchie et al., 2019; Twomey and O'Mahony, 2019; O'Higgins et al., 2019; Kull et al. 2019; Jay et al., 2016; Jay,

2015; Flannery et al., 2015) and Global South (Harris et al., 2019; Kirkman et al., 2019; Hamukuaya et al., 2016; Hassan and Haque, 2015). Transboundary MSP has no legal underpinning and tends to take the form of voluntary agreements or short-term project (e.g. Transboundary Planning in the European Atlantic (TPEA); Supporting Implementation of the MSP in the Celtic Seas (SIMCelt); Baltic SCOPE- Towards coherence and cross-border solutions in Baltic MSP; MARISMA- MSP and Governance of the Benguela Current Large Marine Ecosystem).

It is important to emphasise that although the implementation of EBM through transboundary MSP is still in its infancy, many obstacles have been encountered. Problems that are synonymous with local or national level MSP processes such as the politically charged process of negotiating spatial conflicts among stakeholders (European Commission, 2017) can be exacerbated at a transboundary scale (Kull et al., 2019; Jay et al., 2016). Geopolitical relations between neighbouring jurisdictions and differences in language, culture, awareness of the transboundary issues and institutional arrangements required stakeholder participation mechanisms to be tailored to each context at both national and transboundary scales (Jay et al., 2016; Jay, 2015).

The only transboundary MSP example identified in the literature that involved a shared marine ecosystem with a dispute maritime boundary was that of the EU-funded TPEA (Transboundary Planning in the European Atlantic[13]) project (Jay et al., 2016) This research-led investigated the delivery of a commonly-agreed approach to transboundary MSP in the European Atlantic region in partnership with Government from Ireland, the UK, Portugal, and Spain. Two pilot sites were used to trial the approach, east coast Irish Sea involving Ireland and Northern Ireland (a devolved administration of the United Kingdom and the Gulf of Cadiz; Spain and Portugal). The pilot site on the island of Ireland was focused on the eastern seaboard around

[13] Further information on the TPEA project and associated publications can be accessed through the European MSP Platform: https://www.msp-platform.eu/key-words/tpea

Carlingford Lough, stretching between Ireland's capital, Dublin and Northern Ireland's capital, Belfast stretching out into the Irish Sea.

An important feature of this pilot site was the undefined maritime boundary in Carlingford Lough, one of two contested sea loughs that separate Ireland and Northern Ireland on the island. Whilst efforts to address the boundary dispute were outside the MSP remit, there is no mention of this context or related resource conflicts in the various publications produced as part of the research project (Jay et al., 2016; Jay, 2015; Almodovar et al., 2014). Only two other transboundary MSP publications focusing on the island of Ireland were identified as part of the literature review (i.e. Ritchie et al., 2019; Flannery et al., 2015[14]). These papers are conceptual studies that evaluate the prospect of implementing an all-island approach to MSP. Unlike the TPEA project publications, Ritchie et al. (2019) and Flannery et al. (2015) highlighted the historical and geopolitical background of the ownership dispute and the impacts for marine resource management in Carlingford Lough and Lough Foyle.

The transboundary examples presented in this discussion illustrate that even though the responsibility of MSP typically rests with national states, there is a growing trend of advancing this MEBM tool (primarily through research-based projects) beyond national borders to align with the limits of ecosystems. However, given the general complexity associated with achieving effective transboundary MSP, it is plausible that efforts to implement statutory transboundary MSP in contested marine ecosystems would be problematic.

2.5.3 Summary

The transboundary nature of the sea requires special consideration in terms of the governance and management of natural resources (Papageorgiou and Kyvelou, 2018). Traditional government-led approaches in environmental decision-making have not resulted in the types of governance outcomes required to address the complexity and number of increasing stakeholders impacted by environmental issues

[14] The author of this thesis co-authored both of these papers and contributed content in terms of the ownership dispute and resource conflict.

(Armitage et al., 2012). This section has outlined a selection of theoretical arguments drawn from the fields of environmental governance and environmental management to ascertain to what extent the topic of contested transboundary marine ecosystems has been explored.

Useful insights have been extracted specifically from theories of good governance, common-pool resource governance, interactive (or socio-political) governance and collaborative governance. All of these concepts are critical features to be considered when analysing existing governance arrangements and also when developing recommendations for future governance options the study sites. In terms of operationalising governance through MEBM, the initial outcomes of MSP have not lived up to its promise (Trouillet, 2020; Josse et al., 2019; Tafon, 2019). Its conflict management aspirations and applications to–date appear to be restricted primarily to spatial conflicts and mitigating them through zoning or co-location and co-existence of different marine users (Trouillet, 2020) rather than addressing complex resource conflicts associated with contested ecosystems.

Despite an extensive body of research in the fields of environmental governance and environmental management, this literature review has demonstrated that the issue of resource conflicts in contested marine ecosystems has thus far been under-studied. In addition, there is no panacea for transitioning from good practice principle in good marine governance to effective MEBM in practice in transboundary ecosystems. This type of resource conflict poses insights to a level of complexity in real-word scenarios that fail to fit in to neat conceptual or theoretical good practice frameworks. The next section describes the overall research gap informed by the inter-disciplinary literature review and the conceptual framework of the study designed to address this gap.

2.6 Research gap

The extensive literature review has been necessary to understand the various schools of thought that influence conflict in transboundary marine contexts. The wide-ranging results helped to establish the context and rationale for the thesis and to

confirm the choice of research focus, questions and conceptual framework developed to address the research gap identified. Whilst much academic attention has been directed towards marine governance and MEBM at national and increasingly at transboundary scales, these studies are mostly from the Global North and have focused on marine spaces in stable regions with agreed maritime boundaries between neighbouring countries. The issue of contested marine ecosystems in geopolitically sensitive regions have largely been neglected thus far in the environmental governance literature.

Conflicting stakeholder interests and marine uses within one jurisdiction (as demonstrated by the MSP literature) do not necessarily escalate to scenarios of political deadlock unlike those presented in the case studies, which do. The absence of a clearly defined maritime boundary creates potential for conflict for Governments or marine users dependent on the adjacent resources. Likewise, if one state no longer accepts the legitimacy of a previously agreed maritime boundary, conflict is inevitable. The emphasis in this thesis is on the multi-faceted impacts of this type of conflict that occurs in both of these scenarios. Specifically, this study explores marine resource conflict between stakeholders from different jurisdictions resulting from ambiguous and controversial maritime boundaries.

In order to adequately address the context-specific governance challenges symptomatic of these problematic transboundary ecosystems, research must take a broader inter-disciplinary perspective. An understanding of borders is essential to the study of transboundary areas. In addition, an appreciation of the historical geopolitical relations of the regions and the nature and root causes of resource conflict were critical in the research. This multi-dimensional study could therefore only be achieved by crossing the fields of environmental governance, geography (i.e. geopolitics, and border studies) and conflict analysis and resolution.

According to Song et al. (2013:168), ‘principles are codes of conducts, operating guidelines or yardsticks to internally refer to when decisions and actions are made, evaluated, criticised and when changes are proposed’. The principles reviewed as

part of this chapter (i.e. good governance, common pool resource governance, EA, EBM, MEBM) would appear to more appropriate for marine ecosystems that fall solely within one jurisdiction or possibly for transboundary regions characterised by amicable geopolitical relations. Ostrom's (1990) theory of collective action for common pool resource was the only set of principles that spelt out the need for institutional arrangements to develop and maintain cost-effective mechanisms to resolve conflicts between resource users. However, the overlapping principles of cooperation (across sectors and borders) and stakeholder participation serve as a benchmark and an additional means of evaluating the existing governance arrangements in the case studies.

2.7 Conceptual framework

The conceptual framework was designed with the overall goal of developing innovative solutions to overcome the human barriers to effective transboundary marine resource management in contested marine ecosystems. Its design was principally guided by the findings of the inter-disciplinary literature review and is based on the theoretical pillars of environmental governance, conflict analysis and resolution, and geopolitics and borders studies (Figure 2.7).

The analytical component of the framework involved the development of a multi-perspective baseline based on the assessment of the contextual variables from the case studies. The specific concepts and theoretical frameworks selected from the literature for this thesis were:

1. **Governability assessment**- centred primarily on interactive (socio-political) governance (Chuenpagdee and Jentoft, 2009 based on Kooiman et al., 2008) and common pool resource governance (Tenzing et al., 2018; Ostrom, 1990).
2. **Resource conflict analysis** (Guo, 2018; 2012; Adano et al. 2012; Grey et al., 2009; Sadoff and Grey; 2005; Yasmi et al., 2005; Glasl, 1997; Goffman, 1974)
3. **Geopolitical analysis of the maritime border disputes** (Lacoste, 2012; Hensel et al., 2008; Agnew, 2008; Van Houtum, 2005; Paasi, 2002; Wallman; 1978)

According to Chuenpagdee (2011), issues and conflicts in marine resource management lie in all three aspects of Kooiman et al.'s (2008) interactive governance model; the socio-ecological system to be governed, the governance systems and their interactions. The overall quality of governance can be improved and redirect marine ecosystems towards sustainability through systematic and holistic governability assessments (Chuenpagdee and Jentoft's, 2009).

The field of conflict analysis and resolution presents many different methods of interpretation and analysis. The importance of viewing resource conflicts from multiple perspectives is a central theme in the literature and has been incorporated as an over-arching concept in the methodology. The systematic analysis of conflict as they evolve through different stages helped to identify the root causes that of conflict emergence and escalation (Yasmi et al., 2016; Glasl, 1997).

Geopolitics describes the historical or current narratives attached to power relations between states, particularly in relation to contested territory and its natural resources (Lacoste, 2012). Disputed boundaries are inherently geopolitical and understanding this is crucial when investigating resource conflicts in contested ecosystems (Guo, 2018; Hensel et al., 2008). This thesis analysed boundaries in terms of their inherent enabling and disabling functions (Agnew, 2008) and the morality of maritime boundaries within the context of inevitable winners and losers (Van Houtum, 2005). Wallman's (1978) though-provoking series of open-ended questions on the meaning of borders were integrated into the interview methodology. These questions served as a practical tool to analyse the significance of the contested boundary from multiple perspectives on either side.

In terms of the evaluation component, the literature on analysing and framing conflict was most useful for this thesis (de Man, 2016; Hisschemöller and Hoppe, 2001; 1995; Rein and Schön, 1994; Goffman, 1974). In an attempt to offer new insights and potential steps towards a solution, the resource conflicts were considered holistically, and from multiple stakeholder and inter-disciplinary perspectives This approach facilitated their re-framing (Hisschemöller and Hoppe,

2001; 1995), enabled the identification of uncertainties and geopolitical realities (de Man, 2016) which led to the development of context-specific insights for future governance options for each of the case studies presented in the following chapters.

MULTI-PERSPECTIVE ANALYTICAL FRAMEWORK:
RESOURCE CONFLICTS IN CONTESTED TRANSBOUNDARY MARINE ECOSYSTEMS

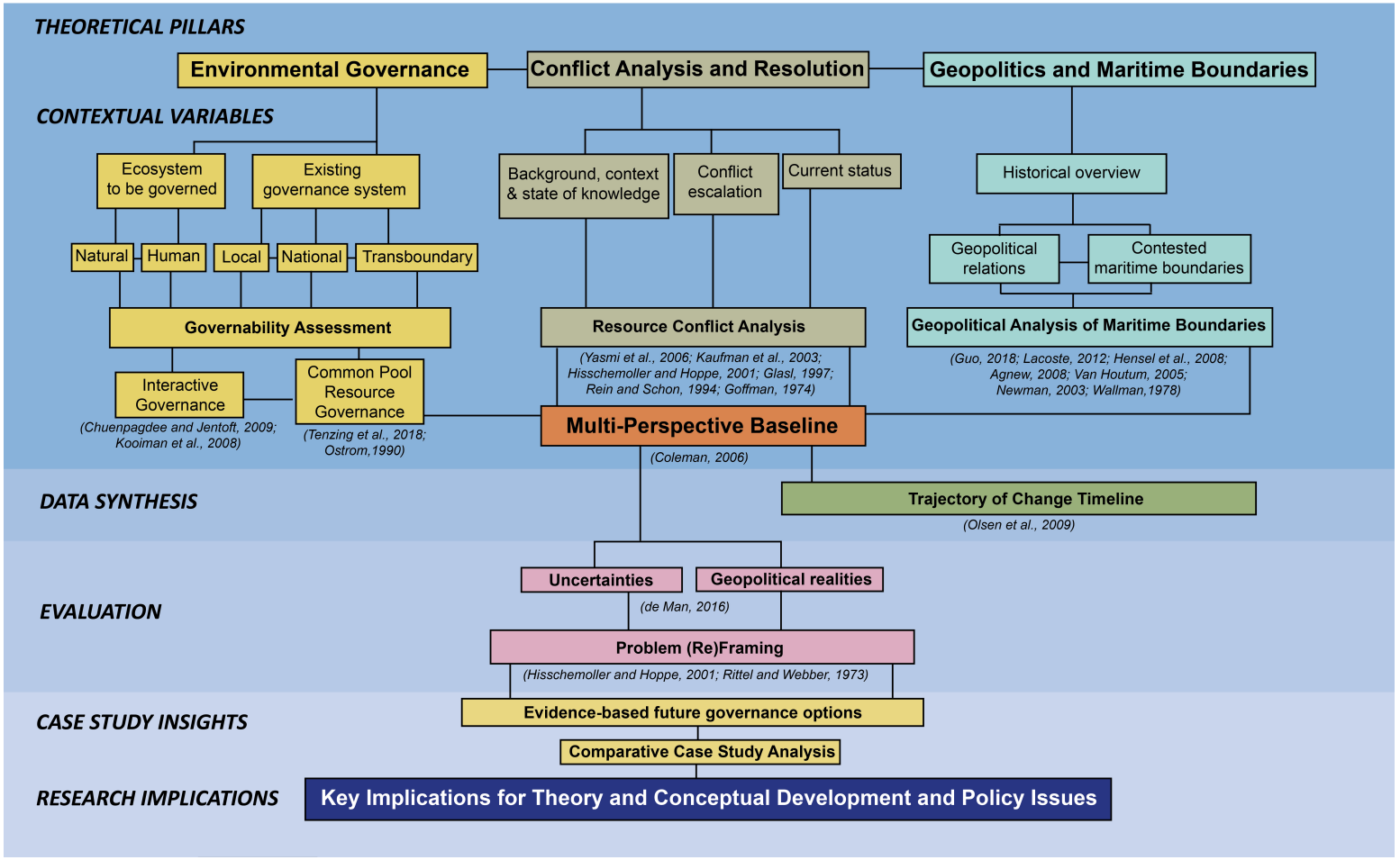


Figure 2.6: Conceptual framework for the case studies

Chapter 3: Research Approach and Methodology

3.0 Introduction

This study was designed as qualitative, exploratory and inter-disciplinary research applied to two case studies to gain a better understanding of the complexity of marine conflict in contested transboundary ecosystems. This chapter provides a detailed description of the research approach and methodological framework adopted for this thesis. The first section presents the over-arching research approach under-pinning the study design. This is followed by an account of the methodological framework developed to answer the research questions and meet the study objectives (Table 3.1). This includes a discussion of the step-by step methods used at different phases, justification for their selection, and an explanation of how the results were analysed and evaluated.

Table 3.1 Research aims and objectives

Research Aims	1. Better understand contested transboundary marine issues.
	2. Explore whether agreed maritime boundaries are essential, or whether some resource conflicts can be successfully managed through informal arrangements or resource sharing regimes in contested marine ecosystems.
Research Objectives	1. Develop a multi-perspective interdisciplinary framework to critically analyse resource conflicts in in contested marine ecosystems.
	2. Establish a multi-perspective baseline of information on resource conflicts stemming from case studies of contested marine ecosystems.
	3. Identify key issues from current practices via insights from the case study analysis to understand the complexity and uncertainties around geopolitical realities affecting marine governance in these contexts.

3.1 Research Approach

The philosophical foundation guiding the overall research design broadly aligns with social theory and applies an interdisciplinary lens spanning the fields of

environmental governance, geopolitics, border studies and conflict analysis and resolution to examine resources conflict in complex socio-political settings. This research approach draws on two related paradigms of social inquiry; interpretive inquiry (Parsons, 2010; MacIntosh et al., 2007) and critical constructivism (Parsons, 2010; Lee, 2012), whereby knowledge is considered a subjective social construction. Interpretive inquiry focuses on investigating perspectives on the meanings and interpretations individuals assign to actions, behaviours and experiences (Given, 2008). It also examines interactions among individuals and the historical and cultural contexts people inhabit (Creswell, 2009). This type of constructed knowledge engages with social theory (e.g. through in-depth case studies) to address socially significant phenomena, incorporates large amounts of purposefully collected relevant evidence, and results are generated from the systematic analysis of this evidence (Ragin and Amoroso, 2011). Similarly, critical constructivism argues that knowledge is socially constructed, and interpretations are underpinned by historical, social, cultural, economic, and political contexts (Scotland, 2012; Kincheloe et al., 2011). From this perspective, we inhabit a world of our making (Onuf, 1998) and behaviour is structured by the meanings developed to interpret ideas, beliefs, norms and identities (Parsons, 2010).

Both approaches to social inquiry generally produce qualitative data (e.g. through interviews with open-ended questions) to enable realities to be critically examined from multiple stances and perspectives (Scotland, 2012). 'In a qualitative world, no single, determinable truth exists. Instead, there are truths to be found, and these truths are bound by the time, the context, and the individuals who believe them' (Morrison et al., 2011:27). At a theoretical and methodological level, qualitative data is becoming increasingly used in socio-environmental systems research and related interdisciplinary efforts to tackle complex ecosystem sustainability challenges (Jones et al., 2018; Bennett et al., 2017; Rust et al., 2017; Mace, 2014; Hicks, 2010).

Qualitative research primarily involves the collation of textual or numerical data mostly from verbal or textual mediums which is analysed and interpreted in order to reveal significant patterns and trends that describe a particular phenomenon, event

or subject or object (Chigbu, 2019). Central to qualitative research is the 'microscopic details of the social and cultural aspects of the subjects under investigation' (Geertz, 2003: 10) through methods such as case studies, interviews and group discussions (Chigbu, 2019). These 'microscopic details' are particularly pertinent to this study which specifically focuses on the human dimensions of resource conflicts. Interpretive inquiry and critical constructivism approaches were thus deemed most appropriate for this research which aims to propose pragmatic solutions for stakeholders (and by stakeholders) to resolve resource conflicts associated with longstanding maritime boundary disputes.

As an exploatory study, the research design adopted an inductive analysis approach whereby an area of study (i.e. resource conflict in contested marine ecosystems) was selected and the research questions emerged from the interpretation of the data (Strauss and Corbin, 1998). The purpose of employing this specific approach was to: (i) summarise extensive and diverse raw text data into a practical format; (ii) establish clear links between the research objectives and the summary findings derived from the raw data; and (iii) develop evidence-based insights and theory about the underlying experiences or processes that emerged from the raw data (Thomas, 2006).

3.2 Methodological framework

The overall research design required a methodological framework for integrating a number of research methods to collate, analyse and evaluate multiple sources of primary and secondary data from two case studies. This approach helped to enhance the vailidity, credibilty and reliabilty of the results (Bogdan and Biklen, 2007) and to contribute to designing evidence-based insights towards more effective governance and conflict resolution strategies in contested marine ecosystems.

The methodological framework (Table 3.2) designed for this study consisted of five broad research phases. Each distinct phase corresponded with the core elements of the conceptual framework (presented in Chapter two) and yielded a series of results and outputs that fed into the wider study. In reality, some of the phases overlapped

as this study was conducted over a six-year period (on a part-time basis). Phase 1: preliminary research; Phase 2: primary and secondary data collection (desk and field-based); Phase 3: case study data processing and analysis; Phase 4: supplementary multi-disciplinary literature review and analysis; and Phase 5: reporting.

Table 3.2 The methodological framework designed for this study (including the key methods and associated outputs for each phase of research).

RESEARCH PHASE	LINKS TO CONCEPTUAL FRAMEWORK	KEY METHODS	RESEARCH OUTPUTS
Preliminary Research: **Desk-based** **2014- 2016**	Identified relevant theories and concepts from the fields of Environmental Governance, Conflict Analysis and Resolution; Geopolitics and Maritime Borders.	Inter-disciplinary literature analysis specific to the research topic	Chapter 1: Introduction; Chapter 2: Inter-disciplinary literature review.
		Case study/study-site selection	Lough Foyle, Ireland and Northern Ireland; Palk Bay, India and Sri Lanka.
		Designing the methodological framework	Chapter 3: Research approach and methodological framework.
		Designed the interview schedule	Annex 1: interview schedule.
		Sampling: Purposive and snowball	Key informants identified for the case studies.
Primary and Secondary Data Collection for the Case Studies: **Desk and field-based** **2015-2020**	Developed a baseline of information for each case study relating to the three key pillars: Governance (i.e. the ecosystem to be governed, the existing governance system); Resource Conflict (background, context and how it escalated); Geopolitics and the contested maritime border; and evidence-based insights towards more effective future governance	Inter-disciplinary literature analysis specific to the case studies (e.g. law, political science, natural resource management, environmental geography, political geography, political ecology and anthropology).	Chapter 4 and 5: Baseline of inter-disciplinary secondary data developed to guide the secondary data to be collected for the in-depth case studies.
		Study-site visits	Photographs; videos; local maps; local publications.
		Semi-structured interviews with key informants	Primary data collected: N= 67 (46: Lough Foyle; 21: Palk Bay).
		Media Content Analysis	N= 794 (193: Lough Foyle; 631: Palk Bay); Identified additional key informants to participate in the study.

	options in contested marine ecosystems.	Participatory Mapping	Multiple locations identified as conflict hot spot by the key informants.
Case Study Data Processing and Analysis: **Desk-based** **2016-2020**	Conducted the following activities: Governance Assessment; Conflict escalation analysis; Analysis of the geopolitical realities; Analysis of how the problem (i.e. conflict) was framed and how it could be re-framed to break the deadlock; evidence-based insights towards more effective future governance options in contested marine ecosystems.	Inter-disciplinary literature analysis (specific to case studies)	Chapter 4 and 5: In-depth case studies.
		Transcribed and inductive coding of the semi-structured interviews	Transcripts of circa. 105 hours of data in total: 67hrs: Lough Foyle; 38hrs: Palk Bay.
		Multi-perspective analysis of coded interview data	Coded the data to produce 4- 6 key categories to present the results from the interviews.
		Media Content Analysis	Frequency of reporting; framing of the conflict(s) from different sides of the border.
		Participatory Mapping	ArcGIS geo-referenced conflict hot-spot maps produced.
		Timeline mapping	Trajectory of Change Timeline maps produced based on a synthesis of data collated from the inter-disciplinary literature review, the semi-structured interviews and the media content analyses.
		Disseminating the preliminary results from the case studies at peer-reviewed conferences	Oral presentations at the Environmental Science Association of Ireland (ESAI) conference, University of Limerick, Ireland (March 2016); American Association of Geography (AAG) conference in Boston, USA (April 2017); MARE: People and the Sea (Social Sciences) conference, Amsterdam, The Netherlands (June, 2018).
		Comparative analysis of the case studies	Chapter 6: Discussion
		Critical evaluation of the findings	Chapter 6: Discussion
		Evidence-based insights towards more effective future governance options in contested marine ecosystems	Chapter 7: Conclusion and implications for theory, conceptual development and policy issues

Supplementary Literature Review: **Desk-based** **2019-2020**	Identified relevant theories, concepts and new literature for the case studies from the fields of Environmental Governance, Conflict Analysis and Resolution; Geopolitics and Maritime Borders	Inter-disciplinary literature analysis (specific to the research topic and the case studies)	Chapter 1: Introduction; Chapter 2: Inter-disciplinary literature review; Chapter 4 and 5: Current state of the knowledge for each case study; Chapter 6: Evaluation of the findings against existing literature.
Reporting: **Desk-based 2019-2020**		Finalised the thesis chapters following feedback and revisions.	Submission of draft PhD thesis to supervisors and final version to examiners.

3.2 Research methods

Each research phase was characterised by distinct step-by-step methods and techniques selected to answer the research questions and analyse and evaluate the results from the case studies (Table 3.3). This section provides a description and explanation for the choice of methods and step-by-step procedures used in this study to answer the research questions and achieve the overall objectives of this thesis.

Table 3.3: The step-by step research methods and techniques employed during the different phase of this study

RESEARCH PHASE	STEP-BY STEP RESEARCH METHODS AND TECHNIQUES
Phase 1: Preliminary Research	1. Sourced inter-disciplinary literature and publications relevant to the broad research topic from the fields of Environmental Governance, Conflict Analysis and Resolution, Geopolitics and Maritime Border Studies. 2. Identified and developed the research question and associated objectives. 3. Identified and selected the case studies. 4. Ensured the overall study was compliant with University College Cork's 'Code of Research Conduct (2018) in terms of ethical considerations (inc. fieldwork and the interview process). 5. Sourced funding to travel to the study sites and conduct field research. 6. Identified and invited key informants to participate through purposive and snowball sampling. 7. Collected informed consent from the key informants.

	8. Developed the semi-structured open-ended interview schedule. 9. Sourced maps of the study sites to use as visual tools for a participatory mapping exercise in the interviews.
Phase 2: Primary and Secondary Data Collection for the Case Studies	*Secondary Data* 1. Collated a comprehensive baseline of secondary data from relevant literature and publications specific to the case studies to: • Develop a governance baseline (i.e. natural and human system to governed; existing governance system at different scales; and interaction between these systems. • Establish the background and evolution of the conflict. • Identify the current geopolitical realities; and • Identify how the problem (i.e. the conflict) is framed by different sources. 2. Identified and collated media articles focusing on resource conflicts and the contested borders in the case studies. 3. Identified additional key informants from the media articles. *Primary Data* 4. Pilot-tested the interview schedule and refined the questionnaire 5. Conducted site-visits to four jurisdictions in the two case studies and documented marine activities and infrastructure through photographs and videos. 6. Conducted and digitally recorded semi-structured open-ended interviews (i.e. face-to-face, telephone and online video software) with key informants in order to collect primary data on their perspectives relating to the: • Resource conflict and the contested maritime border, • Capacity of the existing governance arrangements to deal with the conflict, and • Evidence-based insights towards more effective future governance options in contested marine ecosystems.
3: Case Study Data Processing and Analysis	1. Systematically analysed the primary and secondary data collected from the case studies. 2. Reviewed and critiqued the literature and publications specific to the case studies (including those shared by the key informants during the interviews).

	3. Analysed the content of the media articles in terms of how the resource conflicts were framed from different perspectives. 4. Transcribed, anonymised and carried out inductive coding of the interview data. 5. Conducted rigorous and systematic readings of the transcripts. 6. Produced geo-referenced ArcGIS conflict maps based on the participatory mapping exercise used in the interviews. 7. Employed a timeline mapping technique using InDesign software and produced Trajectory of Change Timeline maps for both case studies by synthesising the primary and secondary data. 8. Compared and evaluated the findings from the two case studies as part of a comparative analysis. 9. Presented the preliminary results as oral and poster presentations at academic conferences in order to test and refine the research design.
Phase 4: Supplementary Literature Review	1. Revisited the initial literature and publications analysed in Phase 1 and 2. 2. Identified and reviewed relevant new interdisciplinary-disciplinary literature and publications to ensure the study incorporated the most up-to-date secondary data in terms of the overall research topic and the case studies.
Phase 5: Reporting	1. Drafted the findings. 2. Compared the findings with past research. 3. Developed evidence-based insights towards more effective future governance options in contested marine ecosystems. 4. Critiqued the limitations of the study including the advantages and disadvantages of using the various methods employed. 5. Proposed future research to validate the conclusions drawn from the study. 6. Provided a copy of the findings to the key informants.

3.2.1 The case-oriented method

This investigation adopted a primarily qualitative case-oriented research design to explore the international phenomenon of resource conflict in contested marine

ecosystems in different geographical and developmental contexts in the Global North and Global South. Whilst some borders have a legally common delimited line agreed by adjoining states through an international agreement, they can be resisted by one side despite a formally agreed framework. In other border areas, when ownership of a territory is disputed, the absence of an agreement on a clearly defined boundary line creates potential for conflict. Examples of both of these scenarios within the marine environment, are examined and compared as in-depth case studies in this thesis.

Lough Foyle, separating Ireland and the UK, exemplifies the governance challenges posed by a disputed border bay with no formal agreement which has become synonymous with a host of resource conflicts over the past century. Territorial and geopolitical issues relating to Lough Foyle gained prominence in recent years as a result of the UK's decision to leave the EU. Palk Bay is a semi-enclosed sea that remains fiercely contested between the south Indian state of Tamil Nadu and Sri Lanka even though an IMBL was formally agreed in 1974. It has been characterised by intense hotspots of conflict relating to IUU fishing, particularly in the last decade, since the end of the civil war in Sri Lanka.

A case study approach was selected for the purpose of this study as it is considered particularly appropriate when developing theories through in-depth analysis of historical, cultural and practical dimensions of phenomena or places (Baskarada, 2014). Contextual conditions are critical to the phenomenon under study and this technique was deemed suitable for this research because the focus of the study involves 'how', 'why' and 'when' research questions (Yin, 2018; 2009; Dooley, 2002). Qualitative accounts originating from case studies, (for example through interviews), not only help to describe the data in genuine contexts, but also help to decipher the complexities of real-life situations which may not be captured elsewhere through quantitative surveys or statistical analysis (Zainal, 2007).

Multiple cases typically lead to more robust outcomes than single-case research, especially in the context of inductive theory building (Eisenhardt and Graebner,

2007). In addition, dual case studies can be used to either illustrate contrasting or similar results for expected reasons (Yin, 2018). As the research involved study site visits and face-to-face interviews (with limited finances), specific cases were fieldwork determined and chosen based on a pragmatic approach driven by appropriateness of the study site combined with an opportunistic purposeful sampling strategy. Appropriateness relates to the ability to demonstrate a fit to both the purpose of the research and the phenomenon of inquiry (Kuzel, 1999). An opportunistic purposeful sampling strategy bases the selection of case studies on convenience (Shakir, 2002 based on Patton, 1990). This strategy takes advantage of convenient access to a case study, for example, due to geographical proximity (i.e. Lough Foyle is 400km by road from the author's residence) or prior connections with professionals familiar with the study site that acted as gatekeepers to some key informants (i.e. the author capitalised on an existing network of academics in Europe and Asia that had previously conducted research in Palk Bay). An additional factor to acknowledge was that the selection and number of case studies was influenced and constrained by other factors (reported by scholars), including availability of data (Darke et al., 1998) and access to key informants (Walsham, 2006).

Case studies tend to focus on a small geographical area or a limited number of individuals as the subjects of study (Baskarada, 2014; Zainal, 2007). By including both qualitative and quantitative data, case studies can facilitate a methodological assessment of both the processes and outcomes of phenomena and events through reconstruction and systematic analysis of the cases under investigation (Tellis, 1997). A combination of desk-based and field-based data collection techniques facilitated the close examination of multiple sources of primary and secondary data within a specific context (Yin, 2018; Yin, 2009).

While different shared transboundary resources vary in terms of physical differences and maturity of governance approaches, they still share commonalities in their broader human use characteristics (Campbell and Hanich, 2015). A comparison of the high-level findings from each case can contribute important insights to the existing body of literature in terms of contrasts and similarities (Vannoni, 2015). By

employing a comparative multi-perspective analysis in this thesis, the intention was to identify conceptual parallels, differences and insights to develop more robust governance arrangements in critically challenging transboundary ecosystems.

Whilst the case-oriented method was employed due to a range of strengths including; the emphasis on context and in-depth exploration and the use of a wide-range of collection methods for multiple data sources (Tellis, 1997), it is acknowledged that there are inherent limitations associated with this technique. For example, it has been reported that the uniqueness of the data implies that it is not easily replicated (Gerring, 2007). There can be also ethical issues in terms of reliability and validity such as an element of subjectivity and researcher bias (Yin, 2009).

In light of these potential limitations, the case studies showcased in this research drew from multiple fields (i.e. from the fields of environmental governance, conflict analysis and resolution, geopolitics and border studies) and followed best practice procedures for the systematic collection, recording and analysis of the 'chain of evidence' (Tellis, 1997). For example, a comprehensive literature review, enriched the validity of the study (Dooley, 2002), identified relevant gaps in the existing body of knowledge and connected them to the research questions (Darke et al., 1998). The design of the instruments used for data collection and the rigorous analysis of that data were a critical component in safeguarding a high degree of validity. In terms of enhancing the reliability of the primary data collected by the interviewing process, interpretation of the data was taken back to the key informants to confirm if the interpretations captured by the research accurately represented their views.

3.2.2 Data collection methods

Case study findings are likely to be more accurate and conclusive if the evidence is based on multiple sources of information allowing for data triangulation and the development of converging lines of inquiry (Yin, 2018; 2009; 2003). A wide range of data-techniques were employed to collate primary and secondary data for the case studies. Desk-based activities included targeted inter-disciplinary literature and media content analyses specific to the study sites and the resource conflicts. Field-

based methods consisted of site visits to both sides of the study sites (i.e. four different jurisdictions: Ireland and Northern Ireland; India and Sri Lanka) documented through photographs, videos and audio-recording and semi-structured interviews with key informants. According to McMillan (2008), interview participants that are particularly knowledgeable in a particular field or have expertise in a specific topic are classified as key informants. Participatory mapping was also employed during the interview process to identify conflict hotspots and develop a Trajectory of Change Timeline to trace parallel transformations in the regions.

3.2.2.1 Literature review and critical analysis

Four distinct systematic reviews of current literature including academic, grey literature and policy documents were undertaken in the course of this research, as illustrated in Table 3.2. The first broad inter-disciplinary review commenced at an early stage in Phase 1. Further reviews specific to the case studies occurred in Phase 2 in addition to a supplementary review in Phase 4.

The broad inter-disciplinary literature review (presented in Chapter two) entailed a critical analysis of theoretical arguments from the fields of environmental governance, conflict analysis and resolution, geopolitics and borders studies. Literature pertaining to practical real-life approaches to environmental governance of shared ecosystems (e.g. EBM, MSP, MPAs) in different transboundary marine contexts were also reviewed and included in the analysis. The results of this wide-ranging review helped to establish the context and rationale for the thesis and to confirm the choice of research focus and questions developed to address the research gap identified.

The second and third literature reviews were specific to the Lough Foyle and Palk Bay case studies. These consisted of extensive inter-disciplinary reviews and gap analyses of the existing body of knowledge directly associated with resource conflicts in both contexts. Over-arching topics incorporated an assessment of a range of important contextual factors framed in three distinctive groupings (after Chuenpagdee and Jentoft, 2013; 2009) the natural and socio-political system-to-be governed, the

existing governance system; and the interactions between these two systems. The fourth review supplementary review in Phase 4 was conducted to ensure that new and current relevant research was incorporated into the thesis.

3.2.2.2 Media content review and analysis

The media has become a very influential global source of information in modern society (Katz, 2018). Structured online media reviews were conducted for both case studies. This method involved systematic reviews of major news sources to track articles reporting on general marine matters, resource conflicts, sectoral disputes, resource ownership and territorial issues. Key words incorporated in online the searches included the following: 'cross-border', 'transboundary' 'marine resources', 'conflict', 'territorial', 'maritime border', 'maritime boundary', 'conflict resolution', 'geopolitics', 'fisheries', 'illegal', 'shellfish', aquaculture', 'environment'.

The Lough Foyle media review commenced in August 2016 and covered the period from 2005 to 2019. 2005 was selected as the starting point as prior to this few newspapers had been publishing articles online. The Palk Bay media review began in November 2015 and included articles from 2009 to 2018. Similar to Lough Foyle, 2009 was selected as the starting point because there were extremely limited articles published online prior to this time. Media sources reporting on the resource conflicts were targeted through Google's news search engine which includes a tool to custom the time-range as required (Figure 3.1). The major news sources identified by this initial search facilitated an additional and more extensive media review by using the search function on the individual news websites as illustrated in Figure 3.2. In addition, Google alerts were set up including different variations of the key words used in the initial media searches for the study sites to ensure any newly published articles published were captured in the results.

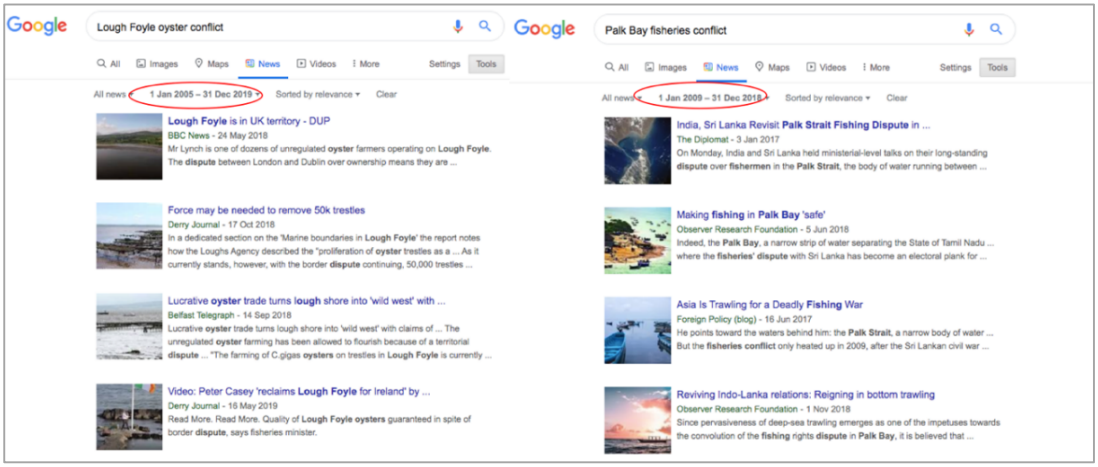


Figure 3.1: Google news search function employed as part of the study to identify relevant articles reporting on the resource conflicts.

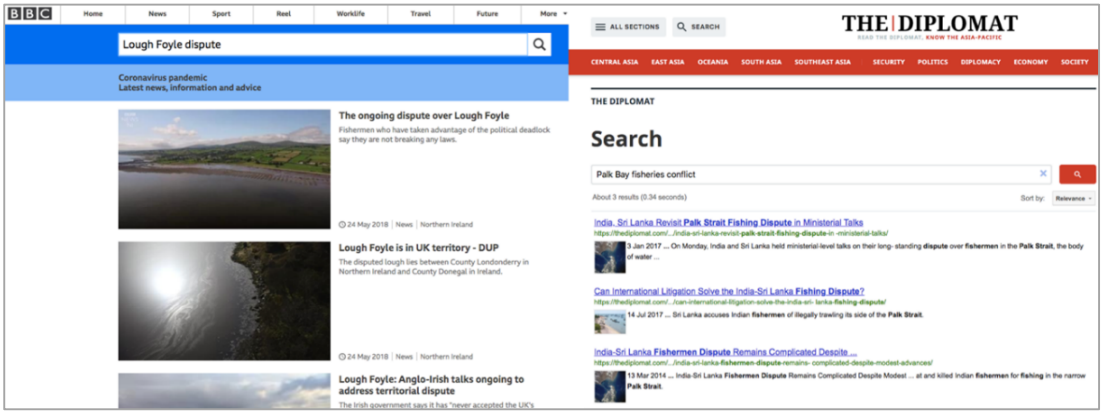


Figure 3.2: Additional review of media sources conducted by using the search function of individual news websites.

A combined total of 1003 relevant news articles were collated for both case studies. The Lough Foyle media review identified 193 articles originating from 33 different online media sources (as a result of the Google news search) from Ireland, Northern Ireland, Great Britain, France, Germany, USA, Canada, China, and Saudi Arabia. 83 articles from predominantly broadsheet sources were derived from Ireland[15], 51 from the UK[16]; 43 from Northern Ireland[17]; and 16 from international[18] sources (i.e.

[15] Irish Independent, Irish Times, Irish Examiner, The Journal, Breaking News, Daily Edge, The Irish Sun, Donegal News, Donegal Daily, Innishowen News, Innishowen Independent, Donegal Now.
[16] The Times, BBC News, The Independent, The Guardian, The Daily Mail, The Sun, Irish Post.
[17] Belfast Telegraph, Derry Journal, Londonderry Sentinel, Derry Now, The Irish News, Slugger O'Toole.
[18] Deutsche Well, Reuters, Irish Central, National Post, China Daily, Xinhua News Agency (China), Arab News, National Post.

France, Germany, USA, Canada, China, Saudi Arabia. The Palk Bay media review identified a total of 810 relevant English-language articles from 18 media sources. 493 originated from India[19], 287 from Sri Lanka[20] and 30 from various international sources[21] (i.e. Asia-Pacific region, USA, UK).

Media content analysis (MCA) is a specialised technique for qualitative and quantitative content analysis. This method captures 'who says what, through which channel to whom, with what effect (Laswell et al., 1948:117). According to Skalski et al. (2017), MCA is a valuable tool for identifying views and gathering insights in a non-intrusive manner and ideally should be used in conjunction with other methods (such as qualitative interviews) to gain a full understanding of perceptions and attitudes (McCombs and Valenzuela, 2020). Whilst the analysis was predominantly based on qualitative aspects of the articles (e.g. whether the issue was framed from a negative or positive stance on different sides of the border), quantitative features such as the volume and frequency of mentions of predetermined key words in context (KWIC) were also examined. The results of these analyses are presented as part of the case study chapters.

According to media framing theory, the media draws attention to certain events and then places them within a field of meaning (Chong and Druckman, 2007). It suggests that how an issue is presented to an audience (i.e. the frame) influences the choice individuals have to interpret that information (Goffman, 1974). The media are now considered as gatekeepers who deliberately collect, select and present topics and events (Wettstein et al., 2018). In order to identify and compare the different framing in the articles identified for the case studies, the following criteria (adapted from Entman, 1991) were considered during the analyses:

1. Conflict between parties can be sensationalised and given precedence over an actual resolution or decision made.

[19] The Hindu, Times of India, Indian Express, First Post India; Frontline India.
[20] Sri Lankan Daily Mirror; Lankan Sunday Leader, Lankan Sunday Times, Lankan Nation on Sunday, Sunday Observer, Tamilnet, Lankaweb, ColomboPage.
[21] The Diplomat; Foreign Policy; The Guardian; Aljazeera; BBC News; Asian Tribune.

2. Stories can be personalised and presented as human-interest pieces to divert from the core issue.
3. News can be over-simplified with key elements excluded from the coverage.
4. Media coverage tends to make a moral judgment regarding a problem.
5. Responsibility can be attributed either for a cause or solution.

In term of limitations, Yin (2009) reports that when reviewing documents, researchers should bear in mind that they may not always accurately reflect reality. Media texts tend to be polysemic and open to different meanings to readers (Macnamara, 2005). It was important to be aware that media sources can be rooted in specific political and economic contexts and are disposed to behave according to those specific local realities (Hallin and Mancini, 2004). Recent research has identified how the media has and continues to play a significant role in influencing the political agenda (e.g. the 2016 Trump election in the USA, the results of the Brexit Referendum in the UK) by selecting specific news items and framing how they are reported (McCombs and Valenzuela, 2020; Katz, 2018; Cacciatore et al., 2016).

In terms of strengths, this technique can be important when sources are difficult to engage or unwilling to participate in the research (Neuendorf, 2018). In the case of Lough Foyle, sources of evidence detailing the current oyster conflict were largely limited to newspapers and media websites with little peer-reviewed or grey publications readily available. These media articles also provided information on key local stakeholders involved in the conflict and these individuals were interviewed at a later stage in the research. In Palk Bay, as access to key informants willing to participate was challenging due to sensitivity of the topic and language barriers, a comprehensive review of media articles helped to supplement the data collected on the fisheries conflict (e.g. no. of arrests, locations of IUU fishing, governance responses to the conflict).

3.2.3 Field work and study-site visits

Extensive field research was carried out on both sides of Lough Foyle over the course of two separate weeks in February 2018 and January 2019, and Palk Bay throughout

December 2015. The core goal of the fieldwork was to observe the study-sites in order to explore first-hand the distinctive wider geographical and socio-economic context of the resource conflicts. They provided an opportunity to meet with gatekeepers to data (Payne and Payne, 2004) in the form of local maps and publications not widely available. The visits facilitated a better understanding of how marine space is used by stakeholders and resource conflicts from both sides of the borders. Marine activities and relevant infrastructure (e.g. fishing harbours, trawlers, oyster farms, cross-border ferry, commercial port, recreation etc.) were documented in a series of photographs and videos. A selection of these photographs is presented in each of the case study chapters to supplement the interviews and provide examples of the various issues relating to the resource conflict discussed by the key informants.

3.2.4 Key informant (expert) interviews

Qualitative interviews are a useful tool to collect empirical data when investigating contextually bound narratives (Fontana and Frey, 2005) that relate to complex decision-making behaviour (Minichiello et al., 1995). In terms of environmental issues, interviews are a widely-used method for gaining information on specific issues, understanding knowledge, values, beliefs or decision-making processes of stakeholders, and strengthening research design and output (Young et al., 2018). They also allow researchers to focus on the interviewees' perspective of what is important or relevant, thereby potentially highlighting issues that the interviewer might not have considered (Young et al., 2018). This process also enables the researcher to begin to understand the world from each participant's perspective (Sutton and Austin, 2015).

Qualitative research seeks to convey *why* people have thoughts and feelings that might affect the way they behave. As a social science concept, the term 'perspective' is often interchangeably used with similar concepts such as perceptions, attitudes, beliefs and values (Klöckner, 2013; Slovic, 2000). Bennett (2016) argued that the term has been applied extensively by scholars of environmental governance and conservation (e.g. McClanahan and Abunge, 2020 Turner et al., 2015; Bennett and

Dearden, 2014; Xu et al., 2009). Perception refers to the manner in which individuals observe, understand, interpret and evaluate an action, event, experience or outcome (Munhall, 2008). Perception can be influenced and framed by a wide range of contextual factors (e.g. politics, culture, socio-economics), past interactions or experiences of similar phenomena, and individual or collective attributes (e.g. race, gender), knowledge base, values and norms (Levine et al., 2015; Munhall, 2008).

A total of 67 in-depth semi-structured interviews were conducted and digitally recorded (46 for Lough Foyle and 21 for Palk Bay) between December 2015 and January 2020. Key informants were targeted based on their professional track record (e.g. policy briefs, academic publications, mentions in media articles etc.) in dealing with the resource conflict. They were representatives from government (at different levels)[22], industry, civil society NGOs and the research community in Northern Ireland, Ireland, India and Sri Lanka. 39 interviews were carried out face-to-face at various locations; 16 in Ireland; 13 in Northern Ireland, six in Sri Lanka and four in India. A further 26 were conducted by video technology (i.e. Skype) and two by telephone. They ranged in duration from 40 minutes up to two hours. Observations made during the interviews were also recorded in a notebook to supplement the verbal data. Table 3.4 provides an overview of the distribution of these key informants by governance domain and sectoral expertise.

Table 3.4. Distribution of the key informants interviewed in the case studies

CASE STUDY	GOVERNANCE DOMAIN	SECTOR/ KEY EXPERTISE	NUMBER OF KEY INFORMANTS
LOUGH FOYLE	Industry	Fisheries	4
		Aquaculture	7
		Commercial ports	1
		Marine leisure and tourism	2
		Renewable energy	1
			15
	Government	Government Departments (Central Government ROI: 5; Devolved Administration NI: 1)	6

[22] Refer to Table 3.4 for specific levels of Government interviewees in each case study.

		Statutory Agencies/ Authorities (ROI: National: 4; NI: Devolved Administration: 2)	6
		Cross-border Agency (All-island: 1 based in case study area in NI; 1 based in ROI capital)	2
		Local Government (County/ District level: ROI: 1; NI: 1)	2
			16
	Research community	Marine Governance	3
		Environmental Science	1
		Political Science	2
		Marine Ecology	1
		Maritime Law	2
			9
	Civil society	eNGO	4
		Local community groups	2
			6
		Lough Foyle Total	**46**
PALK BAY	Industry	Fisheries	**4**
		Aquaculture	**3**
			7
	Government	Government Ministry (State level- Chennai, Tamil Nadu: 2; Jaffna, Northern Province: 1)	**3**
		Harbour Master (Local level- Palk Bay: Rameswaram, Tamil Nadu)	**1**
		Intergovernmental organisation (Bay of Bengal level based in Chennai, Tamil Nadu)	**1**
			5
	Research community	Fisheries Science	**1**
		Social Science	**3**
		Law	**1**
		Environmental Science	**1**
			6
	Civil society	NGO	**2**
		eNGO	**1**
			3
		Palk Bay Total	**21**
		Lough Foyle + Palk Bay Total	**67**

Purposive sampling was the preferred method for the key informant selection as the research required perspectives from individuals with a relatively high level of knowledge of the issues (Ritchie et al., 2003). Relevant organisations from the

different governance domains were first identified through an initial stakeholder profiling exercise based on the literature review. Key informants from these organisations were subsequently targeted based on their professional track record (e.g. policy briefs, academic publications, mentions in media articles etc.) in dealing with the resource conflict and remit in the study sites. In order to prevent bias and ensure a balance of perspectives across the various categories, this method was supplemented by snowball sampling which involved asking those who had already been interviewed to identify other key informants they know who fit the selection criteria (Noy, 2008).

The key informants were initially contacted by email to introduce them to the research topic and invite them to participate in the study. The interview method mode was thoughtfully considered and evaluated (Oltmann, 2016) and geographical distribution played a major component in the type of interviews that were possible. Face-to-face interviews are considered the 'most direct, research-focused interaction between research and participant' (Kazmer and Xie, 2008:258) and the best way to 'enter into the other person's perspective' (Patton, 2002:341). Individuals that resided or worked within the proximity of the study-sites were invited to take part in face-to-face interviews as the preferred option to coincide with the dates of the scheduled fieldwork.

However, not all key informants were available to be interviewed during the dates of the field work. Others were based at locations that were impractical to interview them in person due to the financial limitations and time constraints of this study. In recent decades, these alternative modes for qualitative interviewing have gained in popularity and some authors have argued that they produce comparable results to face-to-face interviewing (Vogl, 2013; Holt, 2010; Opdenakker, 2006). Conducting interviews by video technology and telephone thus allowed for the extension of the geographical range and diversity of the participants in the case studies (Glogowska et al., 2011; Holt, 2010).

Figure 3.3 presents a comparative pie-chart representation of the Lough Foyle and Palk Bay key informants. Forty-six semi-structured interviews were conducted with key informants from Ireland and Northern Ireland for the Lough Foyle case study (42 between February and August 2018 and four in January 2019). Fifteen represented industry, 16 from government, nine from the research community and six from civil society (i.e. community groups and NGOs). Twenty-one interviews were conducted with Indian, Sri Lankan and international key informants for the Palk Bay case study (15 between December 2015 and September 2017 and six in January 2020). Seven represented industry, five from government, six from the research community and three from civil society (NGOs).

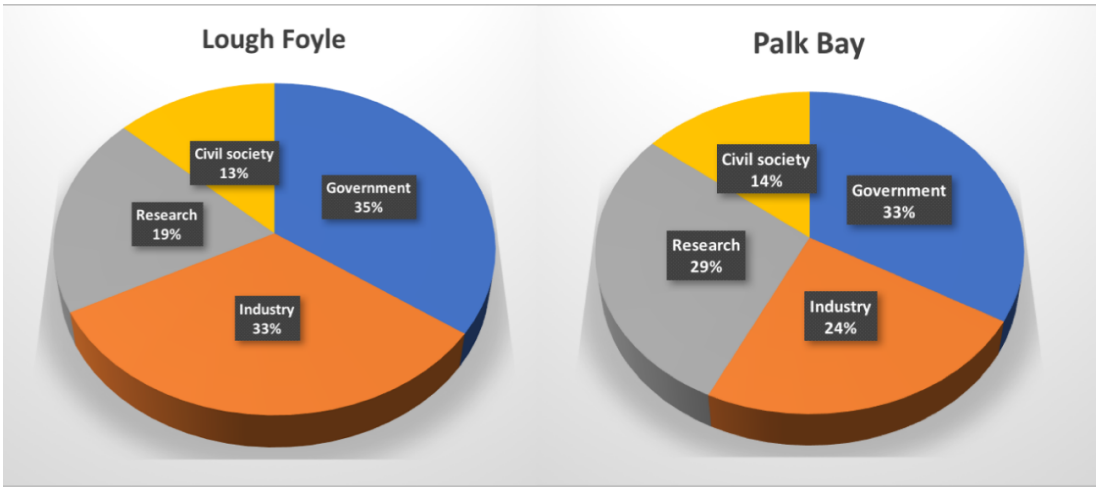


Figure 3.3: Comparative pie-chart representation of Lough Foyle and Palk Bay key informants across different governance domains.

Many interviews were followed by questions and further conversations via email and phone with the key informants. Some shared relevant documents and more detailed information on topics that emerged in the interviews (e.g. links to useful research articles, policy documents, unpublished reports etc.). A number of those interviewed expressed a willingness to participate in future research on the topic and a desire to receive a copy of the findings upon completion of the research.

Structured interviews are based on a fixed schedule of pre-determined questions (Ritchie et al., 2003). Whilst semi-structured interviews also follow a pre-determined

line of inquiry with standard questions asked in each interview, the interviewer has the flexibility to ask additional questions and probe for further detail if an interesting new line of enquiry develops (Dunn, 2000). Semi-structured interviews were selected for the specific purpose of the case study research in order to explore the perspectives of a relatively small sample size of key informants representing government, industry and civil society perspectives on the research topic. This more adaptable method of interviewing was regarded as more suitable for the in-depth analysis of complex issues and their associated 'messy processes' that often arise (Young et al., 2017).

While interviews are a common method in qualitative research, several shortcomings have been raised in response to their extensive use, including the lack of transparency in sampling strategy, choice of questions and mode of analysis (Bleich and Pekkanen, 2013). Rigorous data collection procedures fundamentally influence the results of studies based on qualitative interviews (Kallio et al., 2016). These concerns were mitigated through the application of a robust and systematic interview methodology with distinct stages based on existing guidelines (St. John et al., 2014; Drury et al., 2011). The four stages involved in the interview methodology were integrated into the overall methodological framework and included:

1. Design: Finalising the research questions and developing the open-ended interview schedule.
2. Data collection: Purposive and snowball sampling of the key informants, collecting inform consent from the key informants, pilot testing the interview schedule, refining the questions, interviewing and recording key informants.
3. Analysis and coding: Transcribing, anonymising and coding the data, sending copies of the transcripts to the key informants to ensure the data was accurately captured.
4. Reporting: Writing up the findings (including a critique of the advantages and disadvantages of using this method), providing a copy of the findings to the participants.

The interview schedule was formulated based on a combination of research questions, the wider research objectives underpinning the thesis and the case study objectives. This served as a guide around three broad frames of reference on the resource conflicts: looking to the past, looking to the present, and looking to the future. The core goal of this method was to explore a range of perspectives and assessments of resource conflicts and contested boundaries in Lough Foyle and Palk Bay through a series of open-ended questions. Twelve open-ended questions (i.e. how, what, why, when) were asked to provide opportunities to discuss their views and to encourage their voice to come through in the data. A copy of the interview schedule is provided in Appendix 2.

The interview schedule was piloted twice in both case studies to test the questions in terms of potential sources of bias (Young et al., 2018). For example, although the term 'governance' is widely used in academic circles and government, it was recommended to adapt the terminology in the questions and to describe governance as 'how things operate' 'and who does what'. This recommendation was particularly useful when interviewing industry key informants in Sri Lanka and India. Furthermore, the term 'resource conflict' had mixed responses in the pilot test. In regions that are emerging from protracted violent armed conflict, for some individuals, referring to competition for natural resources or IUU fishing as a fishing conflict seemed incongruous with the wider context. The language used during subsequent interviews was refined and adapted accordingly (e.g. the 'fisheries issue', 'the problem with the oyster farms').

Ethical considerations

The research conducted throughout the course of this PhD adhered to University College Cork's (UCC) 'Code of Research Conduct (2018). As this research involved human participants, ethical considerations were a central component throughout the all stages of the overall study including the interview process from design to reporting. General information on the research topic and a copy of the interview schedule was circulated by email to the participants in advance of the interviews. Informed consent was gained prior to the interviews (Appendix 1). Based on best

practice in qualitative interviewing (St. John et al., 2014), each interview began with a discussion of the aims of the research, how the data collected would be safely stored and used, and assurance that their identity would be kept confidential. In order to ensure anonymity, key informants were coded (i.e. P1 – P67) in the results. Following the interviews, copies of the transcripts were sent to participants who requested them, and this contributed to the accuracy of the data. In line with research integrity best-practice and UCC's Research Data Management Policy (2016), the research data will be securely held on a password- protected external hard drive for a minimum of ten years and then it will be destroyed. Participants were also informed that the overall findings from the case studies would be shared once the research process was finalised.

3.3.3 Data processing and analysis techniques for the case studies

3.3.3.1 Transcription and coding of the interview data

Over 110 hours of interviews were transcribed from the digital recordings. This was followed by a rigorous and systematic reading of the transcripts to consider the multiple meanings inherent in the raw data. An inductive coding technique was applied to analyse and report the qualitative data by allowing the findings to emerge from frequent and significant themes (Thomas, 2006). A summary of the inductive coding technique employed is presented in Figure 3.4. Once segments of the transcripts were coded, this enabled an analysis of interview segments on a particular theme and the relationships between themes identified by the key informants. Similarities and differences across the interviews (e.g. perspectives on boundaries; proposals for future governance options) were also explored. The summary and top-level categories were used as main headings in the case study findings.

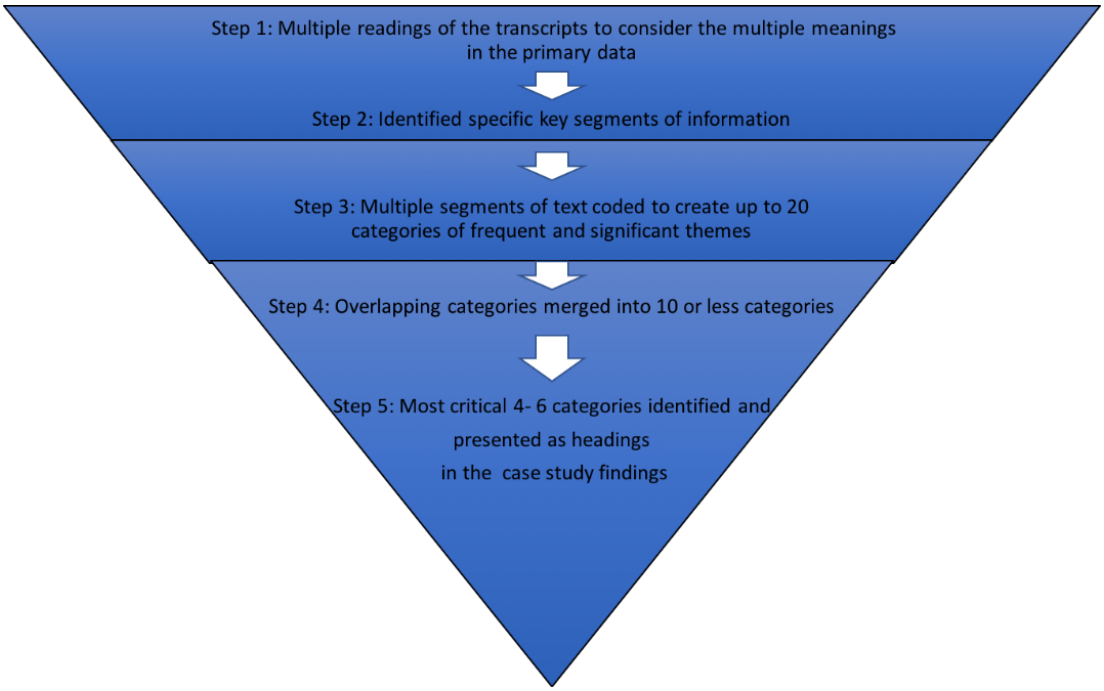


Figure 3.4 The inductive process employed for the analysis and coding of the qualitative interviews, (adapted from Thomas, 2006; Creswell, 2002).

3.3.3.2 Timeline mapping

Timeline mapping was used as part of the interviews to facilitate the key informants' sharing of the most significant events and developments relevant to the resource conflict from their unique perspective. Timeline mapping is a visual communication, arts-based data collection method, derived from a broader framework of graphic elicitation and often used in tandem to qualitative interviews (Kolar and Ahmad, 2017, Kolar et al., 2015; Sheridan, Chamberlain, & Dupuis, 2011; Bagnoli, 2009). Timelines are a type of graphic elicitation technique that have been used for people to reflect upon the past, present and future (Bagnoli, 2009).

This method involves a relatively simple process whereby a graphic is produced to record a sequence of events or developments in chronological order in a focal area extending back up to a century or more. Stakeholder interactions and changes in the use of the marine resources; and the interests and forces operating at larger scales than the focal areas in Lough Foyle and Palk Bay were mapped on a timeline. The timeline provided a panorama of what has happened in the past that has had an impact on the present. This allowed for a systematic historical analysis of the border

by contextualising the current resource conflicts in terms of the wider geopolitical transformations and governance responses across government, industry and civil society. The timelines lead to the identification of distinctive eras (i.e. periods of time spanning a few decades) in which the human uses of the ecosystem and the 'rules of the game' (Olsen et al. 2009) of the governance systems followed a recognisable pattern. This in turn provided valuable insights into how parallel developments and associated governance responses relate to and influence one another both within the border bays and across the regions.

Timeline mapping was specifically selected for this purpose of this research because it is a practical tool that helps to: visualise and synthesis large amounts of data; and deepens understanding by identifying how historical and external factors have influenced current issues. This tool was also a useful mechanism to develop rapport with the interviewee and enhance the contextualisation of the narrative (Kolar and Ahmad, 2017 Kolar et al., 2015; Zacks et al. 2002). This method was both inspired and adapted from Olsen et al. (2009) who employ a Trajectory of Change Timeline approach to track ecosystem change and governance responses by placing current issues in their historical context. Following the mapping exercise with the key informants, primary and secondary data generated from the desk and field research from both case studies were combined to develop a composite TOCT to trace parallel transformations in complex socio-political ecosystems and gain constructive insights for future governance options. The findings presented in the TOCTs were validated by a random selection of the interview sample.

3.3.3.3 Participatory mapping

Participatory mapping is a form of collaborative research where participants are asked to explore issues through maps (Kindon et al., 2007). The use of participatory mapping in marine research has gained increasing attention in the last decade (Moore et al., 2017; Forrerster et al., 2015; Lopes and Videira, 2015; Videira et al., 2012). This technique allows for the spatial analysis and visualisation of a range of information relating to the location of marine resources and interactions between stakeholders in the marine environment (Carocci et al., 2009). A limitation is that

many people have poor spatial awareness and maps can be confusing to them. This was over-come by a blended, meta-method of engagement.

Maps of both study sites were used during the interviews to help visualise the contested regions so as to make the topic of resource conflict more tangible (Figure 3.5). This participatory method was employed to provoke discussion, clarify views and emphasise the geographic realities of Lough Foyle and Palk Bay. Key informants were subsequently asked to identify the locations of key conflict hotspots in the past and present. This data was geo-referenced with ArcGIS to produce conflict hotspot maps for both case studies. This method offers a repeatability dimension and could be used in future research to indicate how the situation has changed.

Figure 3.5 Examples of the maps of Lough Foyle and Palk Bay used with the key informants during the interviews to identify key conflict hotspots in the case studies

3.3.3.4 Comparative case study analysis

In seeking innovative solutions to overcome the human barriers to effective transboundary marine resource management in contested marine ecosystems, this exploratory study sought to identify valuable parallels, differences and insights from contrasting geographical regions. Although the dynamics of the resource conflicts and their historical precedents differ, the results of the case studies from peripheral

geographies were compared based on the analytical criteria presented in the conceptual framework (Chapter six). This included an assessment of the analysis outcomes from the three pillars (i.e. governability assessments, resource conflict analyses and the geopolitical analyses of the maritime disputes). The comparative case study analysis is followed by a discussion of the core findings from the overall study.

3.4 Conclusion

This qualitative, exploratory, inter-disciplinary study which is both descriptive and analytical explores the complexity of resource conflict in contested transboundary marine ecosystems. The goal was to develop empirically-based insights for more effective transboundary marine governance in contested geographical margins experiencing resource conflicts through the application of the conceptual framework (Figure 2.7) presented in the previous chapter. The diversity and interplay of issues, sectors and interests in these contexts requires novel approches to integrate various strands of infromation. The methodological framework was therefore specifically designed to incorporate several research methods to collate and analyse data for the case studies representing multiple disciplines and perspectives.

The next two chapters (chapter four and five) present and analyse the primary and secondary data collected from the case studies of Lough Foyle and Palk Bay. These chapters address the second research objective: *establish a multi-perspective baseline of information on resource conflicts stemming from case studies of contested marine ecosystems.* Based on the findings, a comparative case study analysis is presented in chapter six and addresses the third research objective: *identify key issues from current practices via insights from the case study analysis to understand the complexity and uncertainties around geopolitical realities affecting marine governance in these contexts.*

Chapter 4: The Lough Foyle case study

This chapter applies the analytical framework presented in chapter two (Figure 2.7) and presents the first of two in-depth case studies. Lough Foyle represents a study site from the Global North located within the territorial seas and the findings address the second research objective: *establish a multi perspective baseline of information on resource conflicts stemming from case studies of contested marine ecosystems.*

4.1 Introduction

Located in North-west Europe in the Atlantic Ocean, the island of Ireland is a single bio-geographic unit with two separate jurisdictions. The Republic of Ireland (ROI) is a sovereign state comprising over 80% of the island, and Northern Ireland (NI), is one of the devolved administrations of the United Kingdom (UK) (Figure 4.1). At present, Northern Ireland is the only part of the UK to share a land border with another EU Member State.

Figure 4.1 Map illustrating the location of the island of Ireland and the two jurisdictions of the Republic of Ireland and Northern Ireland in relation to the other devolved administrations of the UK (Source: The author).

Despite being a small devolved administration of the UK located on the periphery of western Europe, Northern Ireland is associated with a recent, violent, past. From the

late 1960s to 1998, armed conflict, commonly referred to as 'The Troubles' was at its highest intensity in Northern Ireland. At the time, Northern Ireland was the most militarized area of Europe, west of the Iron Curtain (Considère-Charon, 2012). This complex border conflict centred on how power should be exercised, and by whom (Hayward, 2011).

The official international land border stretches over a complex and meandering line totalling over 500km with the total number of reported border crossings (both official and unofficial) ranging from 200 to 300 (Carr, 2017). The jurisdictions are separated by two border bays where the terrestrial borders become maritime (Figure 4.2). Ownership of these bays (or loughs) is disputed and boundaries are absent in both; Lough to the south east, and Lough Foyle in the north west (Figure 4.3), which is the focus of this chapter.

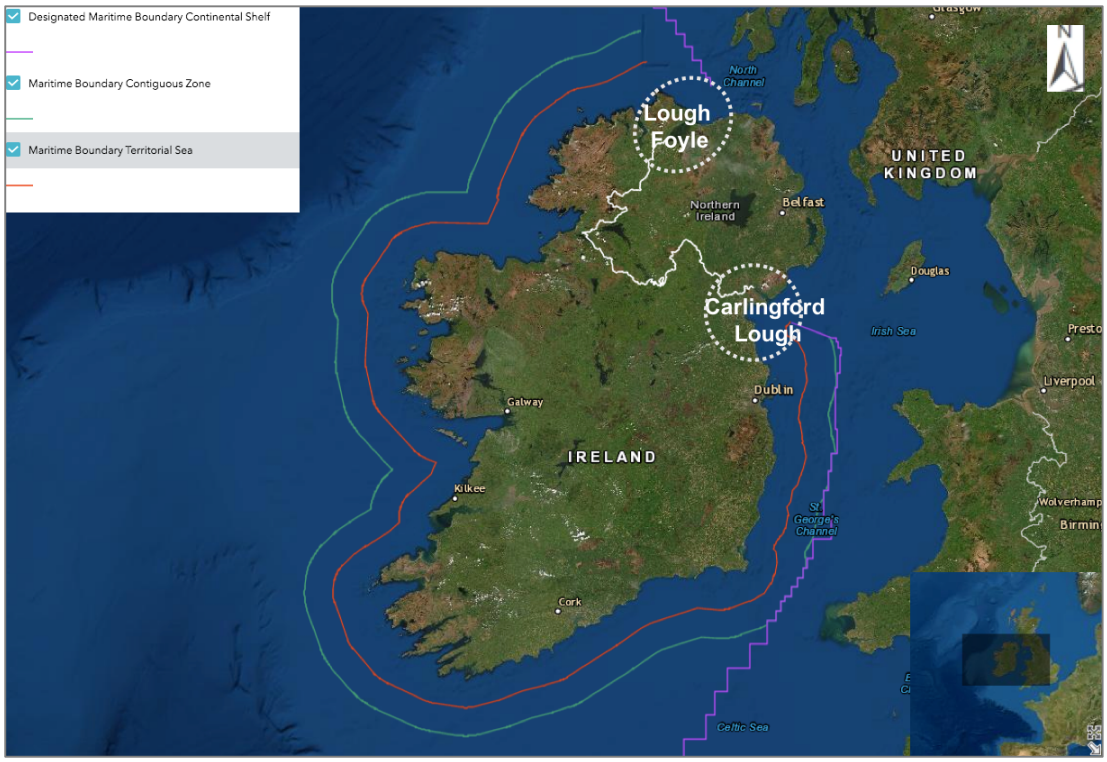


Figure 4.2: Map demonstrating the location of the transboundary sea loughs (or border bays) and the terrestrial border separating the island of Ireland (Source: The author).

Set within the broader study, the objectives for the Lough Foyle case study were to apply the analytical framework (Figure 2.7) to: (i) establish a multi-perspective baseline of information on the resource conflict (ii) critically analyse the interplay between the existing governance arrangements, historical legacy, geopolitical transformations and the current resource conflict from diverse perspectives, in order to (iii) re-frame the resource conflict and (iv) formulate empirically-based insights for future governance options set within the context of current geopolitical realities.

In terms of structure, this chapter broadly follows the sequence of the case study objectives. It begins with an overview of the disputed maritime boundary and the resource conflict, the socio-ecological system to be governed and the existing governance system (sections 4.1.1- 4.3). This is followed by the results of the literature review specific to Lough Foyle, the media content analysis, 46 semi-structured interviews with key informants, and the participatory mapping exercise of conflict hotspots (section 4.4). A synthesis of the results is presented in the form of a Trajectory of Change Timeline (section 4.5). Based on the primary and secondary data presented in the previous sections, the interplay between the existing governance arrangements, the current resource conflict, historical legacy, and geopolitical transformations are analysed (4.6). The chapter concludes with the re-framing of the conflict (4.7) and a series of evidence-based insights for future governance options (4.8).

4.1.1 Overview of the resource conflict and the disputed ownership

The terrestrial boundary has formally been in place since the 1920s (discussed in further detail in section 4.2.1), nevertheless, a century later, it remains a highly contested and politicised space (Nash and Reid, 2016). Agreement on the delimitation of the international maritime boundaries between the Republic of Ireland and Northern Ireland has thus far been unattainable (Leary, 2016); 'either in the two border bays or in regard to the lateral boundaries extending further seawards from Carlingford Lough and Lough Foyle (Figure 4.2). Nor have any official closing lines been agreed to indicate that the two border bays contain internal waters' (Symmons, 2009:457).

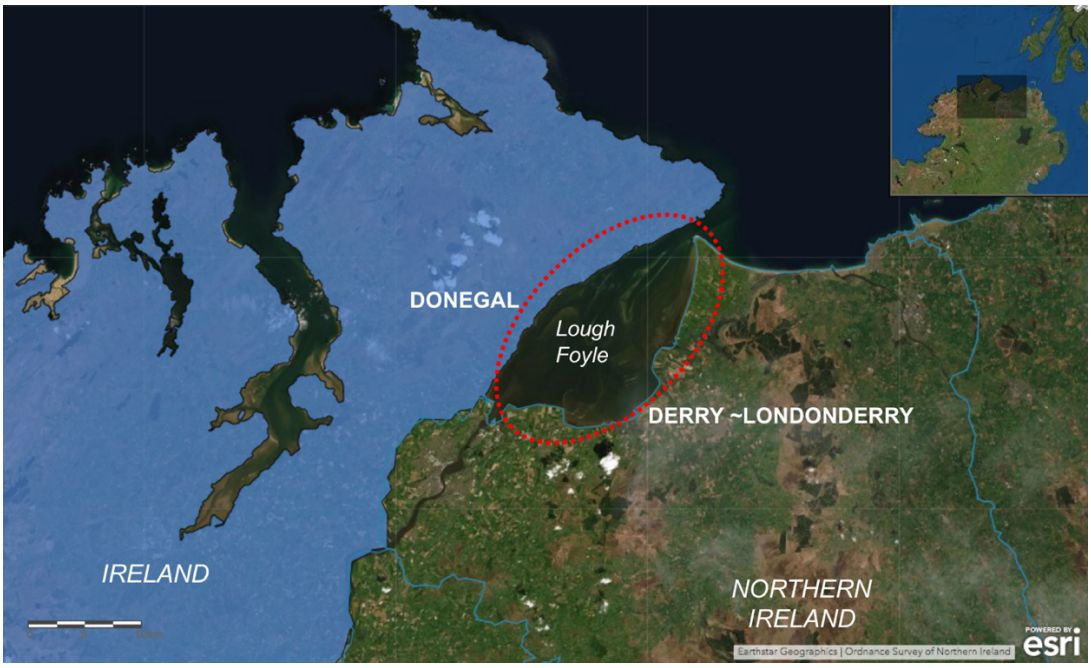


Figure 4.3: Map illustrating the location of Lough Foyle in relation to the counties of Donegal (Republic of Ireland) and Derry (Northern Ireland) (Source: The author).

In legal terms, both loughs are 'juridical bays on the basis of their narrow mouths' (Symmons, 2009: 458). They are not legally different, however in Carlingford, the navigation channel is in the middle and a median line allows management authorities to carry out their functions and is thus less disputed (House of Commons Northern Ireland Affairs Committee, 2018: para. 86). However, in Lough Foyle, the navigation channel runs contiguous to the Inishowen peninsula of the Donegal coast (Figure 4.4).

According to Article 15 of LOSC which relates to the delimitation of territorial seas: 'where the coasts of two states are opposite or adjacent to each other, neither of the two states is entitled, failing agreement between them to the contrary, to extend its territorial sea beyond the median line every point of which is equidistant from the nearest points on the baselines from which the territorial seas of the two states is measured'. Unlike Carlingford, the 'UK Government considers that the whole of Lough Foyle' (up to the high-water mark on the Donegal side) 'is within the UK' (Seanad Éireann, 2016: 891) In parallel, the Irish Government have made it

'unequivocally clear' that Ireland's position is a rejection of the UK's claim regarding Lough Foyle' (Seanad Éireann, 2016: 895).

The location of the navigation channel is critical in Lough Foyle. It adds to the wider complexity of the study site because the application of a median line to resolve the ownership dispute would effectively cut off British access to Foyle Port and vessels would have to transit Irish water to reach their destination in Northern Ireland.

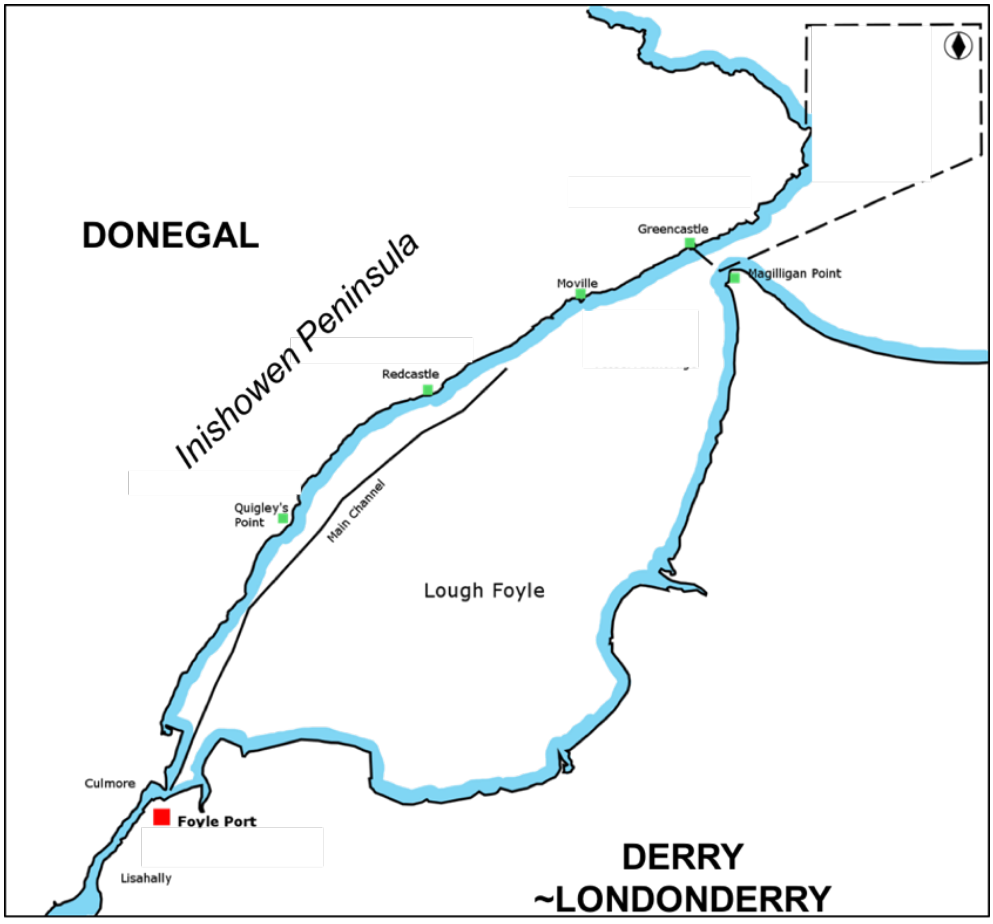


Figure 4.4: Map illustrating the asymmetrical physical geography of Lough Foyle in terms of the navigational channel in relation to the Inishowen Peninsula (Republic of Ireland) and the location of Foyle Port (Northern Ireland) (Source: Map adapted from Londonderry Port and Harbour Commissioners Compulsory Pilotage Area map[23]).

Resource conflict first emerged in the wider Foyle catchment in the form of salmon poaching from the 1930s. The Foyle ownership dispute escalated in 1948 when the

[23] Available: https://www.londonderryport.com/port-operations/navigation-and-pilotage

Honourable Irish Society (a body dating back from the plantation of Ulster[24]) decided to seek a declaratory order to establish their proprietary rights beyond dispute. In 1950, the two governments came to an agreement to buy out the Honourable Irish Society (Leary, 2016). Consequently, in an attempt to address persistent conflict relating to cross-border salmon poaching and disputes about ownership, the Foyle Fisheries Commission (FFC) was established by joint legislation (Foyle Fisheries Acts) in both jurisdictions in 1952. It was innovative at that point in time, in that it was arguably the first ever statutory transboundary governance mechanism with a core remit 'to exercise international jurisdiction over a single area' (or ecosystem) (Hadoke, 1976:1).

Since 2002, various sectoral conflicts with transboundary dimensions that hinge on issues of contested natural resource ownership and seabed rights, have surfaced and intensified in Lough Foyle for various socio-economic and geopolitical reasons. (Campbell, 2017). Examples include a failed offshore windfarm development at Tunes Plateau (Flannery et al., 2015; Ellis et al., 2007), a case of a fisherman prosecuting a cross-border statutory agency (the Loughs Agency) for his alleged illegal fishing of wild oysters without a license on the sea-bed of Lough Foyle in 2007 (which he maintains is a traditional fishing right) has now (in 2020) reached the High Court in Dublin (ROI)[25]; the re-routing of a trans-Atlantic submarine telecommunications cable in 2009 from Lough Foyle to Portrush (Northern Ireland Assembly, 2009).

[24] The Plantation of Ulster was the organised colonisation of the north of Ireland from the 1600s by English and Scottish Protestants settlers on land confiscated from the Catholic Irish.

[25] This was reported in an online article by Enda Craig in August 2020 entitled ' The importance of the ownership of the seabed of Lough Foyle. Following introduction of new legislation by the Loughs Agency that for the first time ever, proposed to levy a licence fee on the traditional wild oyster fishermen on Lough Foyle. All but one of the fishermen paid the fee. He was prosecuted under the new legislation for fishing illegally on the first morning of the fishing season. He in turn summonsed the Loughs Agency for prosecuting him illegally on the basis that he was exercising his traditional right and also that the owners, the Crown Estate (from his perspective) of the sea-bed where the resource are located) had never given their permission for jurisdiction of the sea-bed to the Loughs Agency or ROI or NI: https://www.thepensivequill.com/2020/08/the-importance-of-ownership-of-sea-bed.html?m=0

More recently, the local Pacific oyster industry has capitalised on the political deadlock between the Irish and UK Governments in relation to ownership of Lough Foyle. Pacific oysters are cultivated in bags on metal trestles on the foreshore. In terms of the scale of the issues, the sector has become hugely contentious at a local level due to rapid expansion of unlicensed and unregulated oyster trestles from approximately 2,500 in 2010 to 45,000-50,000 in 2018 on the Inishowen peninsula (House of Commons, Northern Ireland Affairs Committee (HOC NIAC), 2018). This resource conflict has resulted in environmental damage, damaged the market reputation of Irish oysters increased sustainability concerns for the native oyster population and created navigational hazards for boats (HOC NIAC, 2018).

From a socio-economic perspective, Lough Foyle is also unique with 'one in six (51 out of 393) of the region's vessel owners residing around Greencastle and Moville. In terms of the numbers of owners per 1,000 population, fishing is 30 times more important to the local economy than for Ireland as a whole' (Bord Iascaigh Mhara (BIM), 2013:7).

A further timely geopolitical consideration for the island of Ireland is that of Brexit, a term that refers to the UK's withdrawal (including Northern Ireland) from the European Union (EU) following a historic referendum on EU membership in 2016 (e.g. Hayward, 2020; Hayward and Murphy, 2018; Hayward et al., 2018; Cassidy et al., 2018; Phinnemore and Hayward, 2017). The UK is currently mid-way (at the time of writing this thesis) through a 11-month Transition Period and will formally become a Third Country (non-EU Member State) on 31 December 2020. The ongoing debates surrounding Brexit have placed a spotlight on the terrestrial border between both jurisdictions. However, the unresolved maritime boundary in Lough Foyle (and Carlingford) which will assume a new geopolitical significance have largely been excluded from these debates. These border bays will no longer embody disputed socio-political boundaries they will be elevated to the status of a frontier between an EU and a non-EU territory, an unprecedented situation on the island (Figure 4.5). This reality has grave and uncertain implications for marine governance not just in Lough Foyle but also for the entire island of Ireland.

The case of resource conflict in the disputed Lough Foyle ecosystem is an important one because of its timeliness (geopolitical transformations on a peripheral island in north-western Europe resulting from Brexit); longevity (extending from 1922 to-date); the existence of a transboundary governance mechanism (albeit limited to certain sectors); its unquestionable linkages with the wider polarised perspectives on territory on the island of Ireland (marked by diverging values and opposing jurisdictional claims), and the dependency of the local population on the ecosystem for their livelihood.

Figure 4.5: An example of the public response to Brexit in the border region, image captured in February 2018 (Source: The author).

4.2 Socio-ecological system-to-be-governed

This section outlines the basic features of the socio-ecological system-to-be-governed for the Lough Foyle marine ecosystem. These are presented as: historical and geopolitical context influencing the Lough Foyle ownership dispute; the marine biogeography of Lough Foyle; and the socio-economic profile.

4.2.1 Historical and geopolitical context influencing the Lough Foyle ownership dispute

From a terrestrial perspective, the island of Ireland consists of 32 administrative counties. Historically the entire island was part of the UK and political sensitivities led the British Government to establish two devolved administrations. Politically, there are 26 counties in the Republic of Ireland whilst the remaining six counties form Northern Ireland. The Partition of Ireland occurred with the passing of the Government of Ireland (GOI) Act 1920 which created parliaments for both 'Southern Ireland' with a (Nationalist majority and Northern Ireland (with a Unionist-majority and a substantial Nationalist minority).

The GOI Act was intended to create two separate self-governing territories as an internal border within the UK. However, the Government of Southern Ireland was not entirely accepted and, following continued unsettlement, culminated in the signature of the Anglo-Irish Treaty in 1921. The Treaty created Saorstát Éireann (the Irish Free State), as a self-governing dominion within the British Empire whilst simultaneously providing Northern Ireland with an option to opt out of the Free State, which it did. Following this, Southern Ireland gradually severed all remaining constitutional links with the UK government. The demarcation of the border radically altered political and social realities across the entire island (Leary, 2016). In 1937, the Irish Free State was re-named 'Ireland' whilst subsequently The Republic of Ireland Act, 1948 provided that "the description of the State shall be the Republic of Ireland".

The implications of partition within Northern Ireland were that it 'institutionalised a deep intensifying antagonism between two asymmetrical and unequal ethno-national groups' represented by different classes, religions and local identities

(O'Dowd and McCall, 2008: 85). Northern Ireland's constitutional status has been and continues to be the crux of the debate, with the Unionists favouring their status within the UK and the Nationalist community aspiring to a united Ireland (Nash and Reid, 2016). The violent aftermath of the Derry~Londonderry civil rights march in 1968 triggered the beginning of the Troubles as a militarised conflict for the next 30 years (Leahy, 2015).

The Good Friday (or Belfast) Agreement (GFA) brought an end to decades of civil unrest and was reached in 1998 among political parties in Northern Ireland, as well as the Irish and British Governments. It was subsequently overwhelmingly endorsed by referenda by the people of Ireland, North and South, in May 1998. The GFA is lodged at the United Nations as an international agreement and is widely acknowledged as the cornerstone of the peace process and the demise of armed conflict on the island of Ireland (Murphy, 2018; Humphreys, 2018; McCrudden, 2017; Ó Dochartaigh, 2015; McGrattan, 2010; Tannam, 2001). Although the Troubles have ended in Northern Ireland, a legacy of 'physical and psychological barriers remain' that must be 'constantly negotiated and re-negotiated by the regions' inhabitants' (Ó Ciardha and Vojvoda, 2017:12).

The implications of this complex history of geopolitical revisions for marine governance on the island are significant for the case of Lough Foyle where the terrestrial border becomes maritime (Flannery et al., 2015). Partition was carried out on the basis of administrative counties, which were originally defined in terms of their constituency boundaries (i.e. the high- water mark). Article 1 (2) of the GOI Act (1920) provided that Northern Ireland would comprise six 'parliamentary counties' which typically do not include territorial waters (Ritchie et al., 2019). At this time, the intention was that both jurisdictions on the island, north and south, would remain part of the UK and the delimitation of maritime boundaries was not considered. This meant that technically the Republic of Ireland could lay claim to these territorial waters under the former Articles 2 and 3 of the Irish Constitution (Government of Ireland, 1937). Before they were amended Articles 2 and 3 read as follows:

Old Article 2: *'The **national territory consists of the whole island of Ireland, its islands and the territorial seas**".*

Old Article 3: *'**Pending the re-integration of the national territor**y, and without prejudice to the right of the Parliament and Government established by this Constitution **to exercise jurisdiction over the whole of that territory**, the laws enacted by that Parliament shall have the like area and extent of application as the laws of Saorstát Eireann [the Irish Free State] and the like extra-territorial effect*'.

New Article 2:

'*It is the **entitlement and birthright of every person born in the island of Ireland, which includes its islands and seas, to be part of the Irish Nation**. That is also the entitlement of all persons otherwise qualified in accordance with law to be citizens of Ireland. Furthermore, the Irish nation cherishes its special affinity with people of Irish ancestry living abroad who share its cultural identity and heritage'*.

New Article 3:

'*It is the firm will of the Irish Nation, in harmony and friendship, to unite all the people who share the territory of the island of Ireland, in all the diversity of their identities and traditions, recognising that a **united Ireland shall be brought about only by peaceful means with the consent of a majority of the people, democratically expressed, in both jurisdictions in the island.** Until then, the laws enacted by the Parliament established by this Constitution shall have the like area and extent of application as the laws enacted by the Parliament that existed immediately before the coming into operation of this Constitution.*

Institutions with executive powers and functions that are shared between those jurisdictions may be established by their respective responsible authorities for stated purposes and may exercise powers and functions in

respect of all or any part of the island' (Nineteenth Amendment of the Constitution Act, 1998)

Following the signing of the GFA, Articles 2 and 3 were amended, to affirm that the Irish nation is a community of individuals with a common identity (not a territory) and unification (not re-integration) or a 'united Ireland' can only by '*brought about only by peaceful means with the consent of a majority of the people, democratically expressed, in both jurisdictions in the island*'. According to Byrne (1998), this shift of focus from land to people and from territory to nationhood was pivotal in achieving the GFA. However, significantly for Lough Foyle (and Carlingford Lough), these amendments meant that the Constitutional claim to the territorial waters was waived (Flannery et al., 2015).

In terms of '*institutions with executive powers and functions that are shared between those jurisdictions'*, a number of transboundary governance institutions were established, including: The North South Ministerial Council (NSMC); the British–Irish Council (BIC); and six North South Implementation Bodies, one of which is particularly relevant to this study: the Foyle, Carlingford and Irish Lights Commission (FCILC). The FCILC consists of two agencies: The Loughs Agency; and the Commissioners for Irish Lights. The Loughs Agency has responsibility for the regulation of certain policy areas in Lough Foyle and Carlingford Lough, the border bays separating the two jurisdictions (see Fig. 4.2). The NSMC, BIC and the Loughs Agency, and how they relate to the governance of Lough Foyle are discussed in section 4.3.

4.2.2 The marine biogeography of Lough Foyle

Lough Foyle is a shallow sea lough or semi-enclosed coastal embayment which is part of the wider Foyle catchment, watershed, region, valley basin, ecosystem and bioregion (Campbell, 2016). With an average depth of just five metres and a maximum of 15 metres in the navigation channel, Lough Foyle is approximately 186 km^2 with intertidal mudflats covering 20% of its total area (McGonnigle et al., 2011). The lough is about 26 km in length and varies in breadth from 1.6 to 16 km. The

narrowest points are at the southwestern end, where the River Foyle enters the lough, and at the north-eastern end, opposite Magilligan Point.

It has one of the largest catchments of all Irish sea-loughs at 3,700 km^2 with 70% of this located within Northern Ireland and includes the estuaries of the rivers Foyle, Faughan and Roe (Figure 4.5). The River Foyle flows through the city of Derry~Londonderry at the estuary head. A number of small rivers enter the site along its western shore, including the Aught River, Burnfoot River, Meanngland River and Rooskey River.

Lough Foyle supports a wide diversity of species, especially shellfish. A seminal survey conducted in the 1930s documented over 118 different species of molluscs (MacDonald & McMillan, 1951). Historically, fisheries in the Lough have included oyster, mussel and salmon and more recently, green and velvet crab, pacific oyster, lobster, clam, whelk, periwinkle and cockle fisheries have developed (CEFAS, 2007). Many fishermen diversify their fishing portfolio throughout the year to benefit from the seasonality of stocks (Aquafact, 2010).

Ferreira et al. (2008) produced a carrying capacity assessment of Lough Foyle as part of the SMILE (Sustainable Mariculture in northern Irish Lough Ecosystems) Project. The concept of carrying capacity of an ecosystem for natural populations is defined as the stocking density at which production levels are maximised without having a negative impact on growth. A survey carried out in 1982 showed that Lough Foyle had the largest quantity of blue mussels (M. edulis) of any Irish estuary (Crowley et al., 1982). The majority of wild mussels harvested are landed into the ports of Greencastle and Moville and are destined for local markets as well as mainland Europe (Aquafact, 2010).

Lough Foyle is a site of high ornithological importance and supports up to 40,000 migratory birds each winter (Cooper and Gault, 2002). Important populations of three species in particular include the Whooper swan, Light-bellied Brent Goose and

the Bar-tailed Godwit (respectively circa. 5%; 18%; 2% of the international population) (National Parks and Wildlife Service (NPWS), 2014).

A significant proportion of the area is covered by formal nature conservation designations at different scales (Figure 4.6). These include EU designations: Special Protection Areas (SPA) which cover over 2200 hectares on both side of the Lough, a Special Area of Conservation (SAC) at the Magilligan dune system, and international recognition as a Ramsar site combined with and a UK designation of Area of Special Scientific Interest (ASSI) on the eastern shores on the Derry side of the Lough. In addition, mudflats in the south-eastern shoreline are held by the Royal Society for Protection of Birds (RSPB) as a nature reserve and salt marsh at the Roe estuary is owned by the Foyle Wildfowlers' Association (Cooper and Gault, 2002).

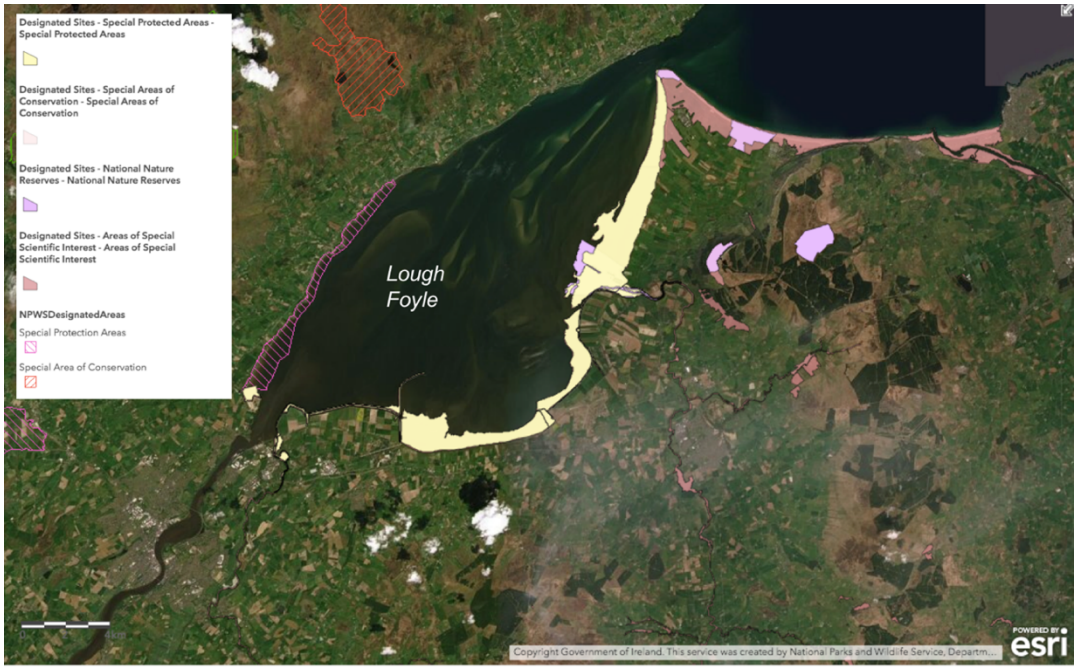


Figure 4.6: Map illustrating the location and extent of nature conservation designations on both sides of Lough Foyle.

Monitoring of water quality indicates that the Bredagh River is seriously polluted with agriculture and the municipal waste treatment facilities as the principal sources (Environmental Protection Agency (EPA), 2018). The equivalent of 2,800 wheelie bins per day of untreated wastewater from Moville is currently being discharged into the

Bredagh River and Lough Foyle at five locations polluting the beaches and coastline (Irish Water, 2019).

Attempts to address this situation through the development of a waste-water treatment plant in Moville by the relevant local authority, Donegal County Council (DCC) (and most recently, Irish Water), have thus far been unsuccessful. Local residents have opposed various plans over the past 25 years. The *Save the Foyle* and its precursor, the *Community for a Clean Estuary* campaign refuted DCC's claim of foreshore ownership in the Moville area as a result of the ownership dispute. The campaign eventually had the original proposed plan over-turned in the European Courts of Justice in 2016 due to discrepancies with the Environmental Impact Statement (Buncrana Together, 2017). According to Irish Water (2019), a new planning application was submitted in 2019 and once construction is completed, the new proposed project will end the discharge of untreated wastewater into Lough Foyle and Bredagh River by 2022.

4.2.3 Socio-economic profile

The border area has developed as a unique peripheral region within the North West of the island. The largest urban centre is located in Derry~Londonderry, a city that has been deeply affected by political circumstances and the socio-economical legacy of The Troubles (Mountford et al., 2012). It is the second largest city in Northern Ireland with a population of 109,853 and over 350,000 in its functional economic area (Northern Ireland Statistics and Research Agency, 2011) The city has one of the youngest demographics on the island of Ireland with almost 40% under the age of 25 (Mountford et al., 2012).

Further north along Lough Foyle, close to the SAC at Magilligan point, the land is used by the Ministry of Defence as a British Army firing-range. There is also a medium security prison (HM Magilligan) and the surrounding dunes have various tourist and recreational uses including a golf course and several caravan parks. West of the Lough, the county of Donegal has a population of 159,192 (Central Statistics Office, 2016) adjoining Derry City and Strabane District Council (DCSDC) (Donegal County

Council, 2016) which has a population of 150,680 (Northern Ireland Statistics and Research Agency, 2018).

84% of the county of Donegal adjoins DCSDC (Donegal County Council, 2016). Cross-border relationships are heavily influenced by the physical geography of the region and particularly pronounced between the Inishowen peninsula and Derry. People in the North-West tend to access services and facilities across both jurisdictions and can live in one and are employed in the other (Donegal County Council, 2016). Change in one jurisdiction therefore invariably has an impact on the other.

Figure 4.7 is a deprivation index which illustrates the sharp variance in affluence and disadvantage across the Foyle region. On the Donegal side, the local population on the Inishowen peninsula vary from marginally average to very disadvantaged, whereas the adjacent jurisdiction ranges from extremely affluent to marginally above average.

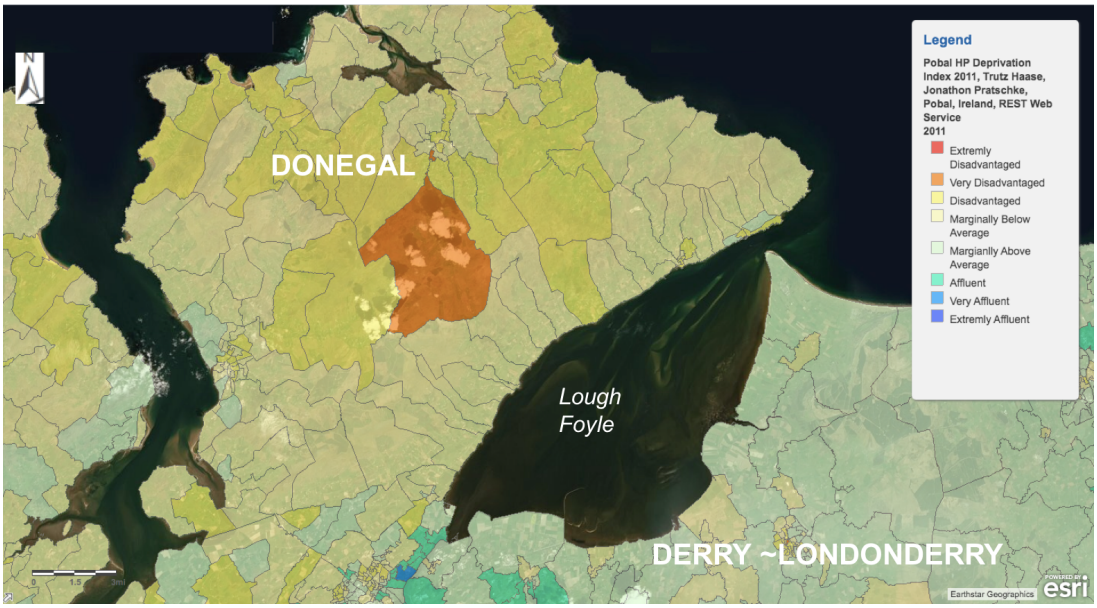


Figure 4.7: Map demonstrating the differences in relative affluence and disadvantage by area across the Foyle region (Source: Deprivation Index produced by Central Statistics Office and Northern Ireland Research and Statistics Agency, 2011).

With its strategic location at the mouth of Lough Foyle, Foyle Port (formerly Londonderry Port & Harbour Commissioners) is a substantial commercial port. It

provides direct and indirect jobs to over 1000 residents from both jurisdictions making a vital contribution to regional economy (Northern and Western Regional Assembly, 2019). In addition to the Port's cargo operations, it is a major tourism asset for the region in terms of the international cruise sector (Northern and Western Regional Assembly, 2019). It's cross-border jurisdiction covers an area of over 180km^2 and extends across the entirety of Lough Foyle, stretching from Craigavon Bridge in Derry City to Greencastle in Co. Donegal and Magilligan Point in Co. Derry. With infrastructure and operations in both jurisdictions, Foyle Port is governed by legislation which pre-dates partition (i.e. 1854) on the island of Ireland and is entirely independent of Government (Northern and Western Regional Assembly, 2019).

From a marine leisure and tourism perspective, Lough Foyle's expansive waters facilitates all forms of water-based recreation. Popular activities include sailing, sea kayaking and canoeing at various locations mostly on the western shores.

As stated previously, fishing is a key source of employment for the local population, particularly on the west side of the Lough. The main fishing port is at Greencastle which has important landings of pelagic, demersal, salmon and shellfish. Other important ports including Moville and Lisahally and Carrickarory pier (McGonigle et al. 2016). Greencastle have increased both their value of landings significantly in past decade with 2018 landings valued at €8 million (Sea Fisheries Protection Authority (SFPA), 2019) compared to €5 million in 2009 (SFPA, 2009).

Historically, commercial fisheries in the Lough included the native oyster, mussel and Atlantic salmon (Leary, 2016; Campbell, 2016; McGonigle et al. 2016; Knight et al., 2002). Oysters have been fished in Lough Foyle since the 18th century, and probably earlier (CEFAS, 2007). The oyster fishery is one of the last remaining productive native oyster fisheries in Europe (Ferreira et al., 2008).

Lough Foyle remains an important shellfish area today and several areas support intertidal and subtidal aquaculture. Central to this study, high numbers of oyster farmers have begun to cultivate pacific oysters via the bag and trestle method and

reach market size in 2-3 years (Figure 4.8). Pacific oysters are not native to Irish waters; they were introduced from the Pacific coasts of Asia which has been a source of conflict with the native oyster fishermen (Kochmann, 2012). Although it is currently not possible to apply or receive an aquaculture license in this region, oyster trestles occur extensively down the western side of Lough Foyle and within the SPA boundary. According to Green and Crowe (2014), based on studies of Lough Foyle, the growth and spread of invasive populations of non-indigenous oysters may threaten important cultural, provisioning and supporting ecosystem services.

There is a dearth of data and information publically available relating to the number of oysters produced in Lough Foyle. This is likely linked to the fact that production in this particular site is currently unregulated by a Government institution and therefore, no official records exist. The only accessible data identified as part of this site-specific literature review describes statistics at a national or country level.

At a national level, farmed Pacific oyster output in the ROI has continued to expand steadily over the past 10 years to achieve an output of 10,122 tonnes output in 2018 with an overall value increased by 2.3 percent to €44.3 million (Bord Iascaigh Mhara (BIM), 2019). Although France remains the main market from a volume of sales perspective, there has been a sharp increase in high value sales to markets in Asia. In 2018, the value of Irish oyster sales to China increased by 83 per cent compared to 2017 (BIM, 2019). In 2014, there were approximately 128 Pacific oyster enterprises in ROI. The counties of Donegal and Waterford account for 60 per cent of this production and over 1,200 people obtain some form of direct employment from the sector (Renwick, 2015). It is estimated that oyster production contributes an €16m euro in output and 249 jobs to the Donegal economy (Renwick, 2015).

Unlike in farming where the producer owns the land, in all other locations outside of Lough Foyle, oyster production requires a license from the Aquaculture and Foreshore Management Division of the Department of Agriculture, Food and the Marine (DAFM). A copy of an Environmental Impact Statement and Natura Impact Statement should be enclosed, if required, with all new, review and renewal

applications. In addition, applications for Aquaculture Licences are processed pursuant to the following national and EU legislation: Fisheries (Amendment) Act 1997 (as amended); Foreshore Act 1933 (as amended); S.I. No. 236/1998 - Aquaculture (Licence Application) Regulations, 1998 (as amended); S.I. No. 270-1998- Aquaculture (Licence Application and Licence Fees) Regulations, 1998; EU Habitats Directive of 92/43/EEC; EU Birds Directive 79/409/EEC; Consolidated Environmental Impact Assessment Directive 2011/92/EU and Directive 2014/52/EU; Public Participation Directive (Aarhus Convention). 'Any person who engages in aquaculture without a licence[26] or who breaches the terms of a licence may be prosecuted through the courts. Any fine imposed by the court may, by Order of the Minister, require the operator to remove any structures and/or equipment' (DAFM, 2020).

However, to-date, no oyster farm operator in Lough Foyle has had to remove any structures or equipment or been fined or prosecuted through the Irish courts for engaging in aquaculture without a licence. The rapid expansion of unregulated and unlicensed trestles in Lough Foyle in the absence of Environmental Impact Statements or Natura Impact Statements (especially in the case of trestles located within and adjacent to conservation sites) therefore raises critical questions for enforcement as both the ROI and the UK[27] are subject to the Habitats Directive[28].

[26] Section 4 of the Fisheries and Foreshore (Amendment) Act, 1998 (No. 54 of 1998) prohibits any person making an application for an Aquaculture Licence from commencing aquaculture operations until duly licensed under the Fisheries (Amendment) Act, 1997 (No. 23 of 1997), and provides that a breach of that prohibition will cause the application to fail.

[27] At the time of writing, the UK had not formally left the EU and was still subject to EU legislation.

[28] The Habitats Directive ensures the conservation of a wide range of rare, threatened or endemic animal and plant species. Adopted in 1992, the Council Directive 92/43/EEC, it forms the cornerstone of Europe's nature conservation policy with the Birds Directive and establishes the EU wide Natura 2000 ecological network of protected areas, safeguarded against potentially damaging developments.

Figure 4.8: An example of the bag and trestle method used for Pacific oysters in Lough Foyle (Source: Foylemore Oysters).

4.3 Existing governance system

This section outlines the current governance regime in place for the transboundary Lough Foyle ecosystem. This includes an overview of the key marine legislation, policies and institutional arrangements relevant to both countries at international, European and national scales. Correspondingly, stakeholders relevant to the Lough Foyle socio-ecological system are represented by a host of diverse institutions and organisations representing different governance domains at various scales in both jurisdictions ranging from the local, to county, national and transboundary scales.

Due to the harmonisation effect of 47 years of EU membership, for now, there is currently a high degree of convergence in the areas of marine and environmental policy and legislation on the island of Ireland. International and EU legislation has been transposed into national law in both jurisdictions. However, uncertainties exist in terms of the extent to which legislation may diverge (and the potential implications) when the UK's Transition Period from the EU comes to end in December 2020. Table 5.2 presents a list of the comparison of the key current legislative and

policy instruments at an international and EU level relevant to marine governance in Lough Foyle. Most significantly for this study, 10 international agreements and EU Directives that have an impact on the marine environment that specifically require transboundary cooperation have been implemented by both jurisdictions.

A critical point to raise in relation to the current resource conflict is that EU law excludes oysters and a host of other aquaculture products from its definition of 'fishery products' in Council Regulation (EC) No 1005/2008 of 29 September 2008 establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing[29]. Although the oyster being produced in Lough Foyle are currently unlicensed and unregulated, from a regulatory perspective, they are beyond the scope of this EU Regulation (which is directly enforceable by the European Commission and its Member States). This reality exacerbates the governance challenges to be addressed in the contested waters of Lough Foyle.

Environmental governance and marine resource management in the Lough Foyle is embedded within a complex governmental institutional framework operating at multiple scales (Figure 4.9) At the highest scale, the BIC is an inter-governmental institution established following the GFA. Its core objectives are to promote positive, practical relationships among the people of the islands and provide a forum for consultation and co-operation. The BIC recognises that threats to the environment do not respect borders making intergovernmental co-operation vital to protect and improve the environment across all jurisdictions (BIC, 2020). The marine environment is one of twelve work areas prioritised and sectoral Ministerial officials meet on a biennial basis.

[29] Annex 1: List of products exempt from the IUU Regulation and its associated Catch Certificate scheme: Freshwater fishery products; Aquaculture products obtained from fry or larvae; Ornamental fish; **Oysters, live**; Scallops including queen scallops, of the genera Pecten, Chlamys or Placopecten, live, fresh or chilled; Coquilles St Jacques (Pecten maximus), frozen; Other scallops, fresh or chilled; Mussels; Snails, others than those obtained from the sea; Prepared and preserved molluscs.

Table 4.1 Summary of the key legislative and policy instruments (not an exhaustive list) relevant to governance of the Lough Foyle ecosystem at an international, EU and national level.

International Legislation, Regulations, Treaties and Agreements	United Nations Law of the Sea Convention 1982 (LOSC) Convention on Wetlands of International Importance 1977 (RAMSAR) Convention on Biological Diversity 1992 (CBD) International Convention for the Prevention of Pollution from Ships 73/78 and Annex 1 1973(MARPOL) United Nations 2030 Agenda for Sustainable Development 2015 United Nations Food and Agriculture Organisation (FAO) Code of Conduct on Responsible Fisheries 1995 (CCRF) United Nations Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks 2001 (UN Fish Stocks Agreement) Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated (IUU) Fishing (PSMA) 2009 North Atlantic Salmon Conservation Organisation (NASCO
EU Legislation	Establishing a framework for Maritime Spatial Planning Directive (2014/89/EU) Marine Strategy Framework Directive (2008/56/EC) Water Framework Directive (2000/60/EC) Shellfish Waters Directive 2006/113/EC Bathing Water Directive (76/160/EEC) Birds Directive (2009/147/EC) Habitats Directive (92/43/EEC) Strategic Environmental Assessment Directive (2001/42/EC) Environmental Impact Assessment Directive (85/335/EEC) Directive 2006/121/EC Regulations adopted under the Common Fisheries Policy Council Regulation (EC) No 1005/2008 of 29 September 2008 establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing Invasive Alien Species Regulation - Regulation (EU) No 1143/2014
EU Policy and Recommendations	EU Integrated Maritime Policy COM (2007) 575 final Blue Growth – opportunities for marine and maritime sustainable growth COM (2012) 494 final EU Biodiversity strategy to 2020 COM (2011) 244 final Recommendation on Integrated Coastal Zone Management (2002/413/EC)

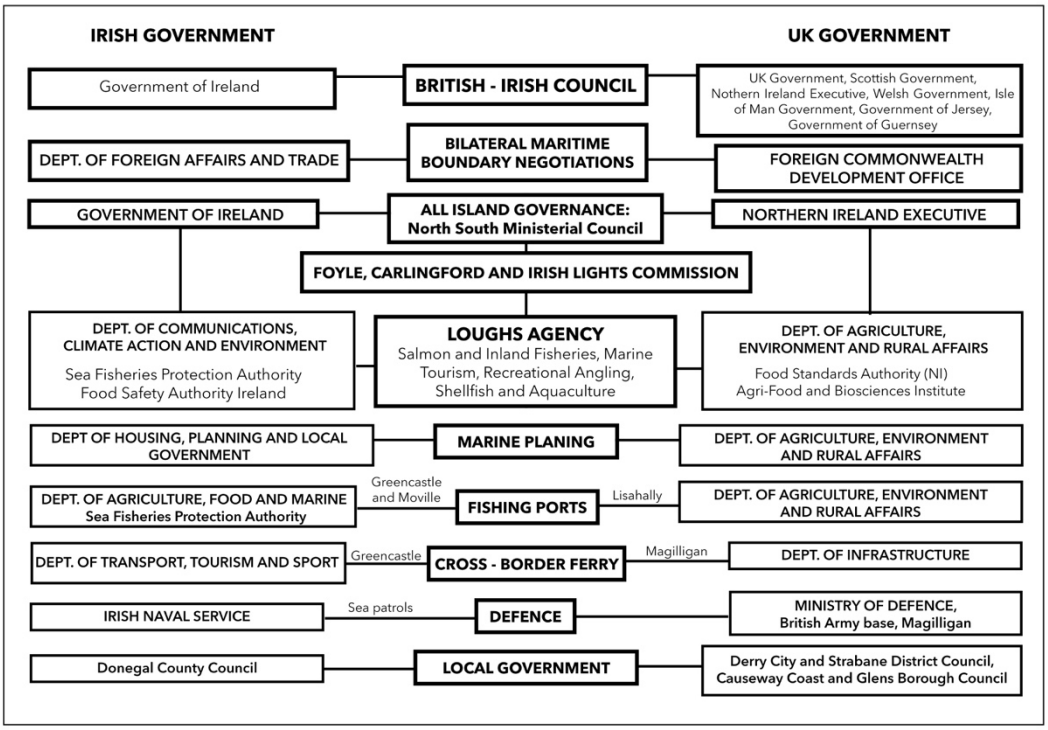


Figure 4.9: Schematic representation of the complex governmental institutional framework (i.e. government stakeholders) influencing marine resource management in Lough Foyle at transboundary (i.e. BIC: Ireland and UK; NSMC, FCILC and Lough Agency: Ireland and Northern Ireland), national and local scales.

Separate from the BIC, all negotiations on the ownership dispute occur at a bilateral level between the Irish Government's Dept. of Foreign Affairs and Trade (DFAT) and the UK Government's Foreign Commonwealth and Development Office (FCDO). At the next scale, the Irish Government cooperates with the Northern Ireland Executive on an all-island basis through the NSMC and the FCILC. The functions of the FCILC in relation to the Foyle and Carlingford areas are exercised by the Loughs Agency under the auspices of the Dept. of Communications, Climate Action and Environment (DCCAE) in the Republic of Ireland and the Dept. of Agriculture, Environment and Rural Affairs (DAERA) in Northern Ireland. In addition, the Loughs Agency are assisted by several regulatory bodies and state bodies; in ROI, the Sea Fisheries Protection Authority, the Food Safety Authority of Ireland; and in NI, the Food Standards Authority, and the Agri-Food and Biosciences Institute.

Established in 1999, the Loughs Agency's has a role in a limited number of sectors that operate in Lough Foyle and Carlingford Lough. In addition to the sea loughs, the Agency manages over 3,600km of rivers and have an overall remit of an area extending 12 miles out to sea from Lough Foyle as demonstrated in Figure 4.10. It is specifically responsible for conservation, protection, development, management and licensing of inland fisheries in the wider catchments, aquaculture and shellfisheries (within the loughs) and promotion of marine tourism in Lough Foyle and Carlingford Lough. However, this does not extend to other marine spheres of responsibility in Lough Foyle such as marine planning, sea fisheries and fishing ports, the cross-border ferry, defence and local government. These functions are governed by a host of other institutions in both jurisdictions (Figure 5.7) and operate independently of the Loughs Agency.

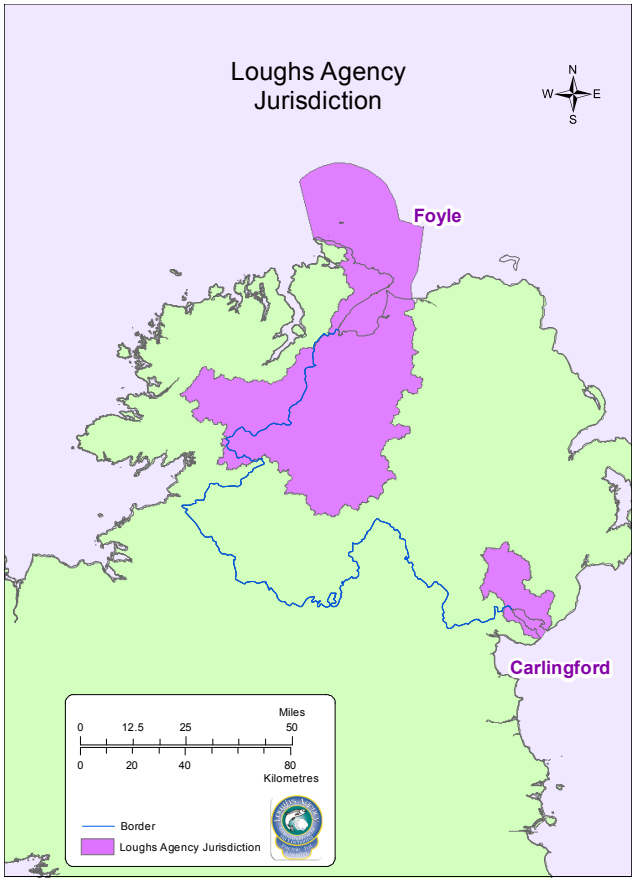


Figure 4.10: The geographical extent of the Loughs Agency's transboundary jurisdiction in the Foyle and Carlingford cross-border areas (Source: Loughs Agency).

Specifically of relevance to this study, joint legislation was drafted in 2007 in both jurisdictions to enabling cross-border functions in relation to aquaculture. The Foyle and Carlingford Fisheries (Northern Ireland) Order 2007 and the Foyle and Carlingford Fisheries Act, 2007 (Republic of Ireland) provided a new regulatory system for aquaculture in the Foyle and Carlingford areas and for the transfer of existing licensing powers in both loughs. However, this legislation has yet to become operational which has been posed a major challenge for a number of stakeholders in the region. The Loughs Agency have appealed for a resolution on a number of occasions through the FCILC and NSMC in order to facilitate the development of the Lough Foyle's full potential (e.g. FCLIC, 2019a; 2019b; 2019c; 2018a; 2018b). They have stated that they do not need the boundary issues to be resolved for them to carry out the licensing functions:

> *It is the Agency's belief that the jurisdictional issue does not need to be resolved to secure the provision of a Management Agreement, designed to roll out the licensing regime and operational activities in relation to the management and licencing of aquaculture in the Foyle & Carlingford Areas. The provision of a Management Agreement between the Department of Agriculture, Food and Marine and the Crown Estates Commission for Lough Foyle and Carlingford Lough is required, in order to confer the authority to the Agency to regulate and manage new and existing aquaculture licences. Once this is in place all other legislative processes can move forward to allow full implementation. This would have a huge impact on the sustainable development of Aquaculture and Shellfisheries activities for the social, economic and environmental benefit for the communities, who influence, enjoy and depend on these resources'* (Loughs Agency, 2018).

In terms of a stakeholder participation mechanism, the Loughs Agency model of transboundary governance incorporates an Advisory Forum established over a decade ago. It was made up of over 50 stakeholder groups from the voluntary, commercial and tourism sectors. Areas of interest include shellfish, draft nets-men, drift nets-men, anglers, fishery owners, tourism, wastewater, industry, local

government, ports and harbours, environmentalists, forestry and agriculture. It also has an Advisory Board that consists of political parties on both sides of the border which strives to ensure that the stakeholders have a consistent voice with regard to the policies and research implemented through the Agency (Nuttall, 2016). Members of the Stakeholder Advisory Forums are divided up into various focus groups and include the following thematic groupings: salmon, inland fisheries and environment; marine tourism including water-based leisure; aquaculture and shellfisheries. The original intention was for these groups to meet up to six times each year (O'Hagan, 2011).

However, there are a host of other stakeholders representing difference governance domains that are not members of the Advisory Forum that play a part in the complex Lough Foyle transboundary governance system. Figure 4.11 shows the breadth of these multi-sector stakeholders from both jurisdictions (in addition to those on the Loughs Agency's Advisory Forum).

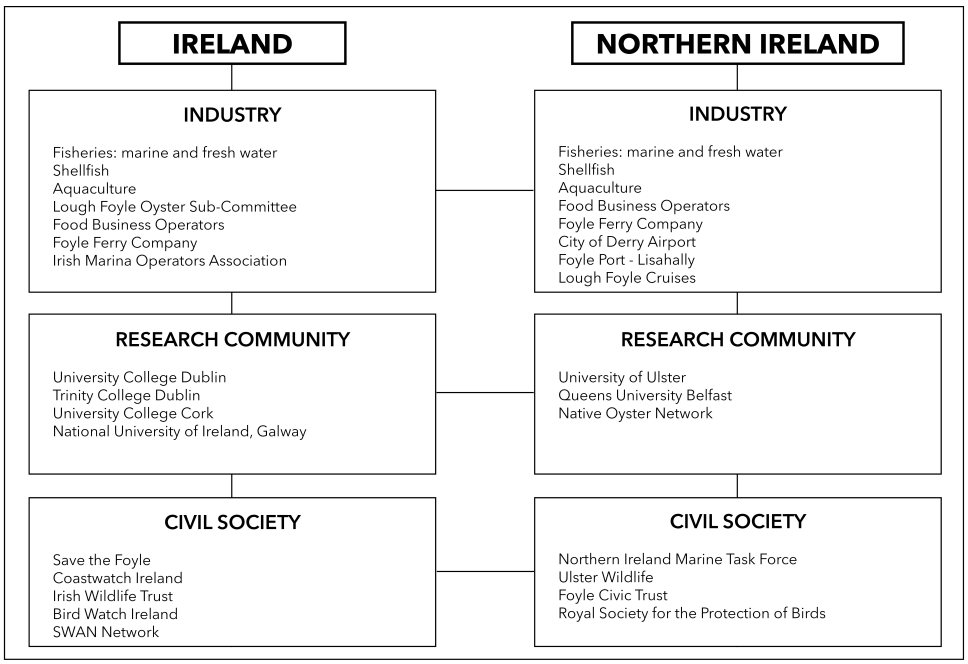


Figure 4.11: Key Lough Foyle stakeholders from both jurisdictions representing industry, the research community and civil society identified as part of this study.

4.4 Results

This section reports the results from various data collection techniques, the Lough Foyle literature review, media content analysis, semi-structured interviews with key informants, and the participatory mapping of conflict hotspots.

4.4.1 Literature review

The result from the Lough Foyle literature search indicate that whilst many articles, chapters and books provide useful wider historical and geopolitical context over the past century or so, there are limited examples of studies that reference the challenges encountered in Lough Foyle. Specifically, there is a dearth of detailed information on the more recent resource conflicts linked to the ownership dispute. Numerous scholars have focused on the unique broader political developments (e.g. Partition, the Troubles, the border, GFA) on the island of Ireland over the past century right up to recent times (Hayward, 2018; Leary, 2016; Nash and Reid, 2016; Considère-Charon, 2012). And more recently, Brexit and its potential impacts on both jurisdictions has received much attention (Hayward 2020; Hayward et al., 2018; Murphy, 2018). Although the terrestrial border has been central to the Brexit debates, the border bays of Foyle and Carlingford have for the most part, been excluded from these analyses.

From a fresh-water and inland fisheries perspective, Kennedy and Kennedy (2000) presented detailed accounts of early salmon poaching (i.e. 1930s -1950s) in the region and issues of property and territory prior to the introduction of the Foyle Fisheries Commission (and the Loughs Agency). Similarly, Campbell (2016) investigates the contested landscape of the Foyle catchment and the evolution of the Foyle Fisheries Commission into the Loughs Agency following the GFA. In addition, the Loughs Agency has featured as an example of best practice in transboundary water governance (Nilsson et al, 2012) and transboundary marine governance and cross-border stakeholder participation (Nuttall, 2016). Absent from these best practice studies is an acknowledgment of the governance limitations posed by the ongoing ownership dispute and the existence of resource conflicts.

A significant amount of scientific research has been conducted by the Loughs Agency in collaboration with universities mostly in Northern Ireland (Queens University Belfast, University of Ulster) and Scotland (Glasgow University). In addition to the SMILE project mentioned earlier (Ferreira et al., 2008; 2007), a host of recent EU-environmental research and capacity development projects have funded PhD studies focusing predominantly on inland fisheries, shellfisheries and aquaculture. One project of particular relevance to Lough Foyle was IBIS (Integrated Aquatic Resources Management Between Ireland, Northern Ireland and Scotland). This project aimed to develop integrated approach to managing the unique freshwater and marine natural assets. Outputs that have contributed to the ecological knowledge base of Lough Foyle include; native oyster spawning assessments (McGonigle et al., 2016) and native oyster restoration procedures (Bromley et al., 2016); coexistence of native and pacific oysters (Zwerschke et al., 2018); salmon conservation management (Miller, 2015); environmental protection (Silverside, 2015).

Additional Lough Foyle studies have been published on various topics such as coastal archaeology heritage (Westley, 2019); impacts of coastal defences on ecosystems (Cooper et al., 2020); dynamics of coastal dunes at Magilligan (Robins and Wilson, 2017) and a comprehensive physical geography and environmental analysis (Knight 2002). In terms of literature specific to the ownership dispute, Brunet- Jailly (2015) highlighted the case of Lough Foyle as part of a compendium of global border disputes. Symmons (2009) presented a legal analysis on the complexity associated with the demarcation of the boundaries in both Loughs. His analysis also provides an overview of how the Loughs Agency was established as a form of mitigating the jurisdictional issues. Flannery et al. (2015) highlighted the protracted ownership dispute in the context of the abandoned Tunes Plateau offshore wind proposal (e.g. Ellis et al., 2007). The authors argue that the political impasse with the boundary restricts the development of an all-island approach to marine governance. They state that there is an ‘obvious need to address the issue of maritime boundaries so as to allow the Loughs Agency to function as prescribed and to create certainty for regulators, developers and all marine users’ (Flannery et al., 2015: 93).

More recently, Ritchie et al. (2019) investigated the potential fallout from Brexit for transboundary marine governance in the Loughs. They argued that the issue of disputed borders (and their associated resource conflicts) is absent from emerging marine planning systems and a more nuanced understanding of borders is essential to advance integrated approaches to marine governance in contested regions. This study addresses this research gap and contributes to the human dimensions literature specific to Lough Foyle and to the broader topic of protracted resource conflicts linked to complex historical and geopolitical contexts.

4.4.2 Media content analysis

The Lough Foyle media content analysis (described in chapter three) identified 193 relevant articles between 2005 and 2019. These articles were published from 33 different online media sources and originated from the Republic of Ireland, Northern Ireland, Great Britain, France, Germany, USA, Canada, China, and Saudi Arabia. 83 articles from predominantly broadsheet sources were derived from; the Republic of Ireland, 51 from the UK; 43 from Northern Ireland; and 16 from different international sources (i.e. France, Germany, USA, Canada, China, Saudi Arabia. Figure 4.12 illustrates the distribution of articles by geographic origin.

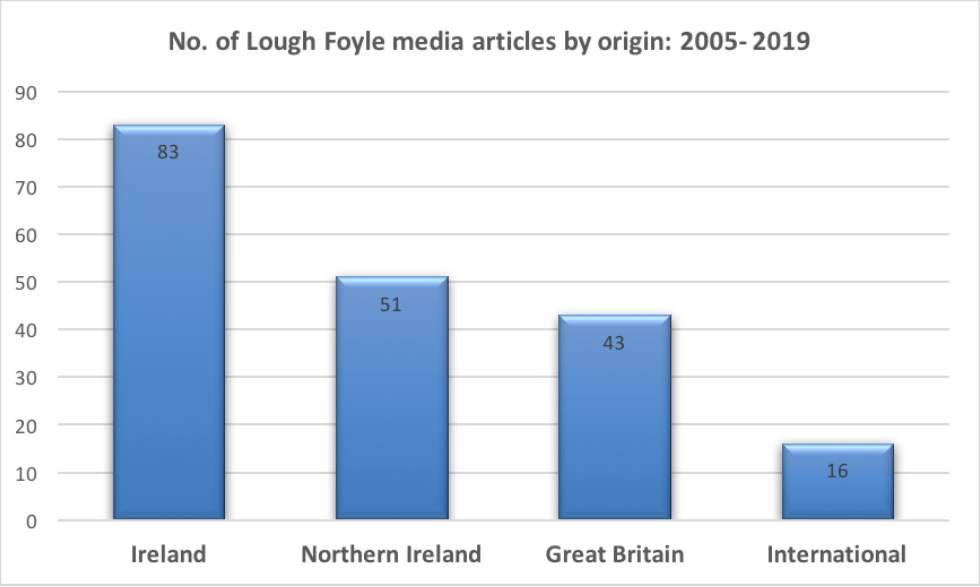


Figure 4.12: Distribution of relevant Lough media articles identified by geographic source (2005- 2019).

It was clear that debates about the ownership dispute ebbed and flowed over the years and were invariably linked to the emergence of various conflicts in different parts of Lough Foyle (Figure 4.13). Whilst there was limited evidence of these conflicts in the literature search, media sources began to increasingly report on them from 2005 onwards. Six key conflicts emerged at different stages: the failed sewage plant, the re-routed telecommunications Kelvin project, the unsuccessful offshore windfarm at Tunes Plateau (2005-2010); native oyster conflict following an outbreak of disease from other sectoral activity (2011- 2012) leading to the temporary closure of oyster fishery in 2014; escalation of the oyster trestles, Memorandum of Understanding (MOU) between Irish and UK Governments as a result of Tunes Plateau conflict (2011-2015); Brexit-related articles, the ownership dispute and the unregulated expansion of the Pacific oyster sector (2016- 2019).

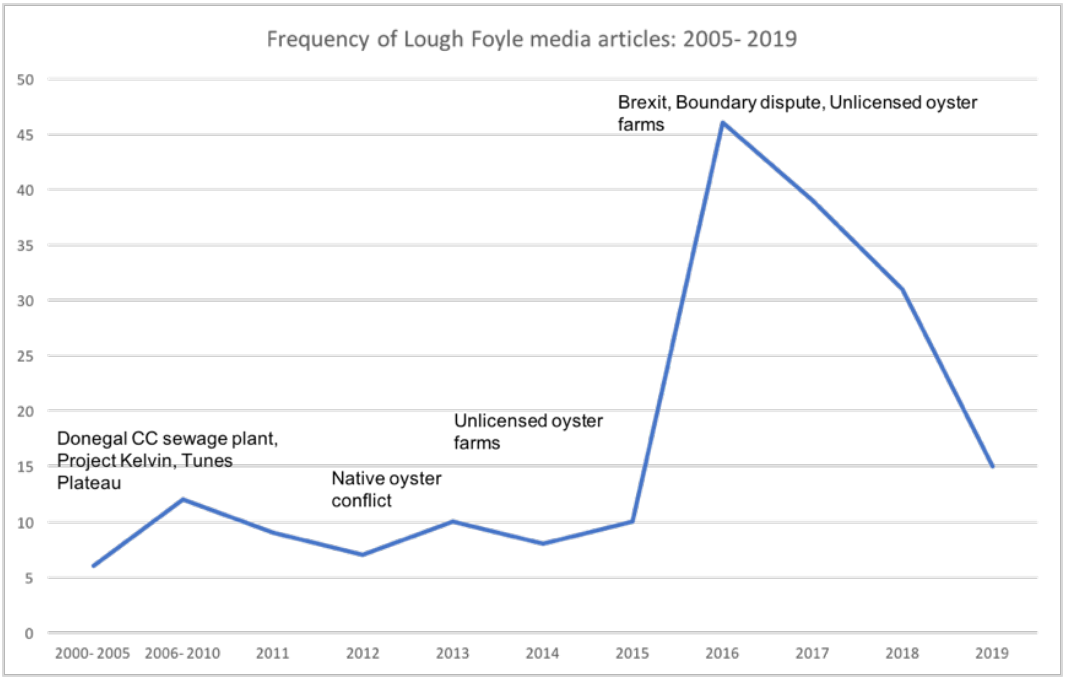


Figure 4.13: Frequency of relevant Lough Foyle media articles and key issues identified from 2005 to 2019.

Most strikingly, the number of reports rose sharply from six to 10 every few years between 2005 and 2015 and peaked at 46 in 2016, following the results of the UK's Brexit referendum. This spike in articles also coincided with a renewed statement by a prominent UK politician claiming ownership of the entirety of Lough Foyle. In 2017,

an Irish television broadcaster (Raidió Teilifís Éireann, RTE) aired a special current affairs documentary on the disputed ownership of Lough Foyle. As part of this television programme, the issue of the unregulated trestles was highlighted which sparked further print media interest. Correspondingly, between 2016 and 2017, 45% of the total articles identified in the Lough Foyle media content analysis were published. Examples of some headlines from this timeframe are presented in Figure 4.14.

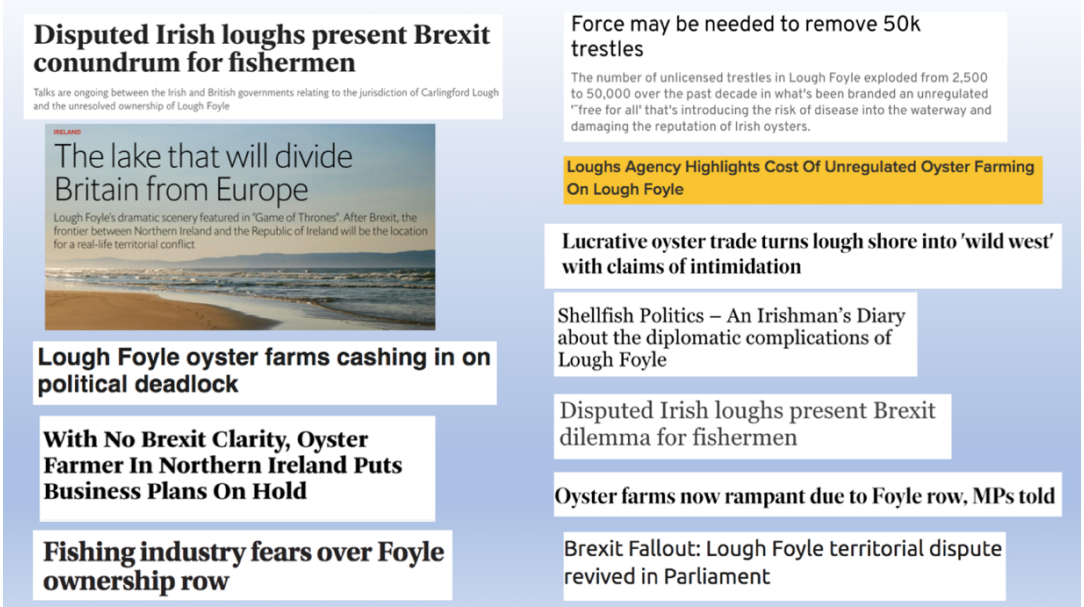


Figure 4.14: Examples of some recent Lough Foyle media headlines linked to the uncertainty of Brexit showcasing the language used to portray the dispute and associated resource conflicts.

4.4.3 Perspectives on the resource conflict

The semi-structured interviews with the key informants focused on their perspectives on the resource conflict and the wider governance systems from the following frames of reference: looking to the past, looking to the present, and looking to the future. This section presents the results of the interviews and the following data in italics are direct quotes from the interviewees that reflect the diverse views explored as part of this study.

The first part of this section begins with a high level overview of the perspectives and then shifts towards more specific aspects of the case study; (i) the oyster conflict as the current manifestation of the longstanding maritime dispute; (ii) political will to resolve the ownership dispute, (iii) the effectiveness of the existing transboundary governance regime and opportunities for multi- stakeholder participation; and (iv) future uncertainties: the potential impacts of Brexit on Lough Foyle. Future governance options proposed by the key informants are included in section 4.7, at the end of this chapter.

There was common ground in a perception of Lough Foyle as distinct and unusual. Throughout the interviews, it was described in various ways ranging from '*extremely unique'* (P4), '*a bit of an enigma*' (P38), a '*no man's land'* (P22), '*not for the faint-hearted'* (P17), and '*a political no-go-area'* (P24). For one interviewee, its peripheral location adds to its uniqueness:

> *'Northern Ireland is uniquely positioned on the periphery of everything, of this island, of the UK and even Europe. The Foyle is on the periphery of that periphery and it's very different than Carlingford Lough. This gives rise to our own unique politics, culture and way of doing things'* (P36).
>
> *Ireland has unique historical and political baggage because of the British and this legacy is very acute in the Foyle area'* (P42).

When questioned about the key milestones or pivotal events that have led to the uniqueness of Lough Foyle, some interviewees focused on historical events dating back as far as the Plantation and Partition. Others deemed more recent developments such as Irish paramilitaries bombing two British ships in Lough Foyle, EU membership in 1973, the GFA in 1998 and the results of the Brexit referendum in 2016 to be more significant to the current situation in Lough Foyle. Table 4.2 categorises these developments (as explored in the interviews) in terms of enablers and constraints for transboundary cooperation and governance in Lough Foyle.

Table 4.2: Examples of enablers and constraints for transboundary cooperation and governance across Lough Foyle identified by the key informants.

Enablers	Constraints
Foyle Fisheries Commission	The Troubles
EU membership	Disputed ownership
EU funds	Lack of licensing and management regime for aquaculture
Good Friday Agreement	Dissolution of the NI Executive
Loughs Agency	DUP- Conservative UK political coalition during Brexit negotiations
MOU for renewables	Uncertainty surrounding Brexit for local industry

In terms of the challenges experienced by various sectors, many of the conflicts identified in the media analysis were also raised in the interviews. For example, the problem of cross-border salmon poaching has persisted throughout history in the Foyle was a topical issue in many of the interviews:

> *'Conflict in the early days was about who owned the salmon and where the border was. During World War II, everything was rationed in Northern Ireland, when Britain was at war, this drove up the both the demand and value of fish. This in turn put pressure on the salmon stocks which fuelled the jurisdictional dispute and eventually brought about the establishment of the Foyle Fisheries Commission'* (P10).

The second type of conflict reported was the abandonment of a substantial offshore wind farm proposal outside the mouth of Lough Foyle. The Tunes Plateau Offshore Wind Farm proposal involved the construction of up to 85 turbines, with a capacity of 150 to 250 MW (Ellis, 2007). In 2002, the UK's Crown Estate granted a license to the consortium that was subsequently opposed by the Irish Government, who claimed that the site overlapped with their waters and therefore, needed the necessary consents and licenses to proceed. Soon after, Northern Ireland

acknowledged the possibility that part of the proposed development could be outside their jurisdiction. In 2004, the developer withdrew from the process and wind farm was never advanced (Flannery et al. 2015; Ritchie and Flannery, 2016):

'The developers decided it just wasn't worth the financial risk of complications trying to put devices in a disputed area' (P41).

Following on from the proposal, the Irish and UK governments signed a Memorandum of Understanding (MOU) in 2011. This MOU states that they 'may each arrange for the lease of the seabed to facilitate the development of offshore renewable energy installations, and for the licensing of construction and operation of such installations, up to their respective sides of the two lines constituted by the lists of coordinates and depicted on illustrative maps' (Northern Ireland Office, 2011:1). It is important to acknowledge that this was a political agreement in relation to future renewable developments specifically in this marine area outside Lough Foyle and not within (Flannery et al., 2015). It does not constitute a legal agreement on the boundaries as indicated by a number of respondents; however, it was a small step forward in terms of the ongoing ownership dispute:

> '*A few years back when there was a proposal to build a wind farm outside Lough Foyle, it nose-dived. As part of that, there was an agreed line drawn by both governments that said you look after the planning and environmental issues on that side and we'll look after the other but it doesn't specify anything about the disputed border. It's good PR (*public relations) but *I don't' know if that would have stood up legally but it was an interesting development in the longstanding dispute'* (P12*).*

(i) The oyster conflict as the current manifestation of the longstanding maritime dispute

The interviews revealed that the most contentious sector currently operating in Lough Foyle was that of the Pacific oyster industry. The rapid expansion of unlicensed

oyster trestles over a significant area on the western shores was reported as the most pressing sectoral conflict in Lough Foyle:

> *'History eventually catches up with us and the local controversy with the trestles is indicative of the ongoing dispute in the Foyle since Partition. There's been other problems before this one and I've no doubt something else will take its place in the spotlight soon enough'* (P43)

Figure 4.15: An aerial view of the scale of the unregulated and unlicensed oyster trestles at Quigley's Point on the Inishowen Peninsula (Source: Loughs Agency).

Oyster farmers have capitalised on this loophole in legislation and the impasse between the two governments. The lack of an oyster licensing regime has resulted in:

> *'a land grab, people were anticipating a change, and everyone went out to stake their claim along the lough'* (P14).

This view was echoed in a number of the interviews; *'the oyster culture has totally taken off in the last decade or so due primarily to the lack of licensing issue in the lough. It's become a free-for-all really* '(P14) that could '*be worth up to €23 million annually if it were managed and regulated properly'* (P35).

Some respondents believed the reason for the proliferation of trestles in the past decade is connected to legislation that was drafted in 2007 but as of yet has not commenced:

> *'I think what's gone on is that they oyster farmers interpreted the 2007 legislation in a way that if they were in, then they'd be able to stay. That's why suddenly from around that time there was this big rush to get their trestles set up and stake their claim on different parts of the foreshore'* (P32).
> *'The oyster farmers are effectively claiming squatters' rights and thinking ahead by strategically trying to grab parts of the coastline for long-term use, it's wishful thinking in anticipation of being granted licenses in the future'* (P22).

From the government's perspective, the incapacity to issue licenses in Lough Foyle is entirely as a result of the status of current legislation:

'*Applications for aquaculture licenses are considered by DAFM under the provisions of the 1997 Fisheries. (Amendment) Act, the 1933 Foreshore Act, and applicable EU legislation. However, the management of aquaculture and associated foreshore licensing functions in Lough Foyle gives rise to legal and jurisdictional complexities. Section 2 of the 1997 Fisheries (Amendment) Act dis-applies the Act to the Moville Area, as it is defined in the Foyle Fisheries Act, 1952. As a result, this Department does not currently have jurisdiction to license aquaculture in Lough Foyle'* (P41).

Strong views on the different types of oyster farmers operating on the coastal strip were also expressed. Some operators have established professional farms, whereas others are less experienced and sub-standard:

> '*Some sites are well managed and that tends to be the guys who are well established oyster farmers in other parts of Donegal, but some are just a*

disaster. Although in fairness, there's seems to be less disaster-type sites than there was four to five years ago (P23).

There are some that are real professionals around Quigley Point, those who have licensed businesses elsewhere in Donegal, they have basically gone through the recession, long periods of no licensing here and they haven't been able to access government supported funds so they're in it for the long haul' (P28).

Many of the oyster farmers interviewed in this study claimed that they have consulted with Government authorities in their respective jurisdictions in an attempt to gain a license but have been unsuccessful. One in particular highlighted the longevity of the licensing issue.

'As far back as 1997, just before the Good Friday Agreement, I wrote to DARD (Department of Agriculture and Rural Development) and I was told I couldn't operate in the Foyle because they couldn't issue me with a license. I've tried numerous times since and it's the same today over 20 years on' (P28).

The frustration associated with the political deadlock was a common theme in many interviews and particularly with representatives from the oyster sector. Oyster farmers want to be able to operate in an official capacity without the ongoing uncertainty, but they are caught in a legal vacuum:

'It's been a waiting game for us all along, waiting for the Governments to sort out the border issue so that we can actually operate above board. There are little to no job opportunities in the peninsula. We don't want to be unlicensed; I'd prefer to be legitimate, but we've been left with no choice. It's either emigrate to Australia or do what we're doing' (P32).

Some operators in the area continue to expand their operations in spite of this uncertainty and future risks:

'Whenever licenses do happen, they'll realise their land grab doesn't actually entitle them to anything and they'll have to go through Appropriate Assessments and Environmental Impact Assessments and all the other hoops, so they know that nothing's guaranteed' (P25).

There were many conflicting views of the oyster conflict from interviewees representing government agencies, NGOs and the research community. These views reflected the complexity of the issue from the perspective of a peripheral, deprived area with limited employment opportunities, especially for younger generations:

'*My fear is that the scale of these trestles has already caused irreversible long-term damage to the ecosystem and this is going to have implications for employment opportunities for this and other sectors in the area in the future*' (P43).

'*Some of the sites are really controversial as they're within EU designated areas but on the other hand, one particular farm is employing over 30 people in their mid-20s to 30s that would otherwise have emigrated to Australia by now and that's the stark reality of it'* (P24).

There's no getting away from it, we're on the edge of the island and forgotten by the politicians and that's why it's been allowed to continue. On the one hand, yeah, they're an eyesore (the trestles*) but they oyster farms are such a big local employer. Some owners really give back to the community in other ways too; one is a big sponsor for local sports clubs and music festivals which is so needed around here'* (P26).

However, one interviewee stated that the trestles were part of a wider 'border mentality' where individuals take advantage of ambiguities that can exist in border regions:

'*The core of it for me is a border mentality, to capitalise on any loopholes that emerge and figure out how we can bleed the border for what it's worth. That*

culture is not unique to just Lough Foyle. All long the land border, you'll see examples of what I mean like the number of petrol stations making the most of the difference in currency between the pound and the euro' (P16)

A significant number of trestles have been erected within a designated conversation site and this is particular area of concern for some. The imminent threat of substantial fines from the European Commission was raised by one interviewee if a case was to be taken against the Loughs Agency and both governments. this is particular area of concern for some:

*'It wouldn't surprise me if somebody was well enough motivated, there's a case to be taken to the European Commission against the entire island of Ireland for infraction and failure to act on the unlicensed oyster trestles in an SAC on the Donegal side of the lough' (*P18).

The potential risk of injuries or serious accidents was also a concern, suggesting that the unplanned nature of the trestles and their proximity to navigational channel is a:

'court case waiting to happen, maybe then and only then will they actually decide to reach an agreement' (P38).

'*It will take a major accident or maybe even a tragedy before the trestles problem gets resolved'* (P24).

Another interviewee echoed this stating that:

'From a navigation standpoint, the trestles should be adequately marked in the same way that aquaculture sites are elsewhere. However, due to the ongoing legal issues, this would have to be done in such a way as to prevent legitimising this infrastructure' (P40).

Figure 4.16: Photograph illustrating oyster trestles partially submerged near Redcastle, Co. Donegal during an incoming tide posing a significant safety and navigational hazard (Source: The author, February 2018).

(ii) Political will to resolve the ownership dispute

During some interviews, there was a reluctance to express views on the disputed ownership possibly reflecting the sensitivity of the topic or an apprehension to disclose personal political affiliations or aspirations for the border. One interviewee stated that '*discussions on the border tend to evoke strong emotional responses for many people in this part of the world' (*P39). This reality was acknowledged by the author and when necessary, attention was moved to other less controversial aspects of the study.

When probed as to why the ownership dispute has endured, many interviewees reported that the current impasse is linked to a lack of political will because it has not been perceived as a priority for either government:

'It's never been resolved for one quite simple reason; it's never really mattered. It gets bounced around different arms of Government. DAFM (Department of Agriculture, Food and the Marine) *in the south use the DFA* (Department of Foreign Affairs) *as an excuse not to progress the dispute, then you have the Crown Estate looking to generate money from the seabed and it seems the Foreign Commonwealth Office aren't too concerned with it all' (P42).*

*'The geopolitical stuff is a red herring; I think it's a matter of inefficiency on the part of our Government. Where there's a will, there's a way and if they wanted to, this could have been resolved a long time ago' (*P21).

'*From the dawn of the Irish State, the baseline in both Lough Foyle and Carlingford Lough has never been defined. The baseline is unclear and from a legal perspective that is the nub of all discussions or attempts at negotiations. The Dept. of Foreign Affairs are currently doing a baseline study and they're still not going near this, nobody is, it really is a no-go-area, it's just not worth the potential repercussions'* (P16).

For one interviewee, there are underlying factors embedded in this dispute that are only discussed behind closed doors in government buildings and it's a safer option to circumvent the issue rather than delimit a boundary:

'The loughs and who owns what, are seen as something that if any progress was actually to me made, it may cause or create a whole load of other issues that governments don't want to face. It's easier to side-step it than open that Pandora's box' (P18).

One interviewee posed an interesting question, suggesting that Lough Foyle itself is not actually disputed, it's the drawing of a line anywhere within it that will the source of a dispute:

'*Is Lough Foyle really disputed? Or is it more accurate to say that the potential influence and fall out from a boundary delimitation is the core issue? Drawing any line is going to cause problems for some. When you look at it from that perspective you can start to see why successive Governments have by-passed this issue over the years.*' (P44).

(iii) The effectiveness of the existing transboundary governance regime and opportunities for multi- stakeholder participation

The current powers of the Loughs Agency and the influence of the ownership dispute were a common topic raised in many of the interviews. For many, the mismatch between the extent of their geographical remit and their legal standing was deemed as inadequate:

'Although the Loughs Agency might have a large geographical remit, really they don't have much legal authority so their powers don't match their jurisdiction and people here know that and that's part of the larger problem' (P22).

'*You would think that a cross-border implementing authority would have powers over every marine activity within their jurisdiction but that's not the case here, it's just for a few sectors so they don't have as much teeth as their name might suggest'* (P38).

If you're dealing with a shared resource, then all the parties from both sides need to be involved in its planning, governance and management. At the minute, that's not the case and the appropriate structures are not in place. We may have them in name but not in functionality' (P14).

Most significantly for this study, several interviewees expressed their dissatisfaction at the inability of the Loughs Agency to issue aquaculture licenses and also to control the spread of the unregulated oyster farms:

'The Loughs Agency are toothless, and they can never fulfil their remit until the dispute is resolved, their inaction with the thousands of trestles has consequences for other sectors and of course the environment' (P22).

We're on the frontline here shouting for licenses to be issued. If ever there was a need for a proper functioning cross-border agency it's now. The Loughs Agency needs to be revamped; it's not fit for purpose. You can't take them serious when they have a mandate for aquaculture but no capacity to implement it' (P17).

'*The Loughs Agency was supposed to break down barriers and remove red tape but what we've seen is that the ambiguity over the ownership is a major roadblock for them*' (P44).

'On paper they're great, but the reality is very different, they could be so much more than they are. Their hands are tied, they've been set up to do a job that they just can't do while the dispute rattles on' (P32).

'Neither Government is likely to agree on a mutually acceptable line in the Foyle or Carlingford for the simple reason of their respective claims. The whole thing will rest on whether they can agree to put their claims aside and develop a flexible and mutually agreeable joint-management solution which is independent from the wider jurisdictional issue but would allow the Loughs Agency to exercise its statutory powers' (P43).

From a Loughs Agency perspective, they are acutely aware of how their limited abilities is perceived by stakeholders but legally they are not in a position to change the status quo:

'*The trestles are quite a worrying issue for us, and we can only sit back and monitor what is going on. If we had those powers, we could go in and regulate*

them, we have the legislation to do it, but our hands are tied for now. All we can do is continue to wait for central Government to sort it out' (P22).

Some interviewees focused on the historical and political legacy attached to the Loughs Agency and the ways in which this context has affected their performance as a transboundary governance mechanism. Present day perceptions are intrinsically linked to past:

'*The actual institutional governance set-up that the Loughs Agency is embedded within, is a key influencing factor to its limited effectiveness. The Agency evolved from the Foyle Fisheries Commission originally set up in the 1950s and it's hard not to be critical when one existing body was retro-fitted and re-named after the Good Friday Agreement'* (P40).

'The old Foyle Fisheries Commission was all about managing the salmon fishery and as a result, the Loughs Agency has inherited this legacy and they're officers are perceived by many, especially on the Donegal side, as protestant bailiffs' (P36).

'*I get very frustrated when I hear them (Loughs Agency) being held up as a great example of North-South cooperation by politicians. It's easy to say that but those on the ground have a different experience, it's flawed on so many levels and they're nothing more than the Foyle Fisheries Commission under a new name'* (P29).

In terms of opportunities for stakeholder participation, several interviewees were critical of the Loughs Agency's Advisory Forum. This stakeholder mechanism was first established twenty years ago as a means of stakeholders exchanging ideas and also as a way of educating stakeholders about the Agency's objectives and procedures across different sectors. However, evidence from the interviews indicates that for some, it hasn't met their expectations as illustrated by the following quotes:

'*The Forum seemed like a great move on their part and I had high hopes for it but unfortunately my expectations weren't met. It was a bit of a talking shop and I didn't get much benefit from it, so I stopped going' (P32).*

*'I attended some meetings a few years back. I wasn't too impressed with the set-up and it lacked the leadership needed to keep people engaged. I think there were actually supposed to be 5-6 every year but that was never the case' (*P45*).*

'The right people weren't there, and you had a few big personalities monopolising discussion with their own micro-agendas. I didn't see how my input would influence how the Loughs Agency could change for the better'(P33).

The whole membership side of it means that lots of relevant people aren't members. I've been involved in other stakeholder things which are open to anyone interested, this one is a bit of a closed shop. I'm not convinced it does what it claims to do. It never really took, it had good intentions, maybe it was just a box ticking exercise for them (P32).

(iv) Future uncertainties: The potential impacts of Brexit on Lough Foyle

*'Partition was the first cliff; Brexit is surely the next cliff' (*P23).

There is little doubt that for many Brexit has revived old wounds in Northern Ireland:

'After the results of the EU referendum, politically things are becoming increasingly more polarised in you're either green (Nationalist) *or orange* (Unionist), *you're not allowed to be in the middle anymore which is so upsetting especially with the 20-year anniversary of the Good Friday Agreement this year. I honestly thought we were past all this, but Brexit has reinstated so much uncertainty' (P26).*

For some, current geopolitical realities linked to the UK's withdrawal from the EU means that the contested jurisdictional issues in Lough Foyle can no longer be overlooked:

> '*James Brokenshire* (ex-Secretary of State for Northern Ireland) *hasn't helped matters when he claimed that all of Lough Foyle right up to the high-water mark in Donegal is part of the UK. This shows that the imperialistic mentality is still alive and well*' (P24).

> '*Lough Foyle presents a problem that has to be solved by someone at some point, especially with Brexit coming up, them* (Governments) *not having addressed this before for whatever reason, now really exposes them to a whole lot of extra problems'* (P42).

The absence of clarity relating to what precisely Brexit will mean was a common topic of discussion. This uncertainty is inherently linked to future prospects for Lough Foyle:

> *'With all the talks, we hear between politicians and in the media, they only seem to be concerned with the border in the Irish Sea between which is a huge concern going forward for NGOs and industry in the lough. If they don't deal with the border issue in the two loughs- if and when Brexit happens- it will never happen'* (P21).

The urgency of addressing the ongoing uncertainty was emphasised by some interviewees:

> *There's a potential threat posed by Brexit that could affect the environmental fragility of the Magilligan area and wider Lough Foyle. A firing range owned by the Ministry of Defence could potentially be expanded after Brexit as the UK enter a new phase of geopolitics outside the EU'* (P15).

'*Ownership of Lough Foyle has been put on the long finger for far too long and now it's come to centre stage with Brexit. You can be sure if oil was discovered, it would've been sorted years ago (P12).*

The fall-out from the unresolved dispute has had massive economic and environmental repercussions here at a local level. The time has come once and for all to put this political issue to rest' (P10).

Conversely, for some interviewees, Brexit is unlikely to bring about a resolution to the longstanding maritime dispute in Lough Foyle. For one interviewee, *'the likelihood of change arising from Brexit is slim to nothing because the Foyle higher-primate ecosystem is so unique'* (P7). This view was shared by others:

'It's only ever discussed on the fringes of other meetings between Governments, it certainly won't be a deal-breaker with Brexit and that's the reason why it never really progressed' (P28).

'*I don't think Brexit will make any difference. People are under the impression that Brexit will be some kind of magic bullet to resolve the issues particularly with the oysters, but the underlying issues have been going on for a long time* (P32).

'I'm not convinced Brexit will solve any of this. I was told in 2007 that an agreement on the licensing system was close, in 2018, I'm still waiting! (P37).

One interviewee raised the controversial possibility of there being no need for a resolution if Brexit resulted in a united Ireland:

'I wouldn't see a situation where one part of the lough is in the EU or in a customs union and the other isn't because neither jurisdiction owns either. Lough Foyle will stay in limbo until such point that both governments come up

with a solution on the border or dare, I say, a united Ireland happens and then none of this would matter' (P29).

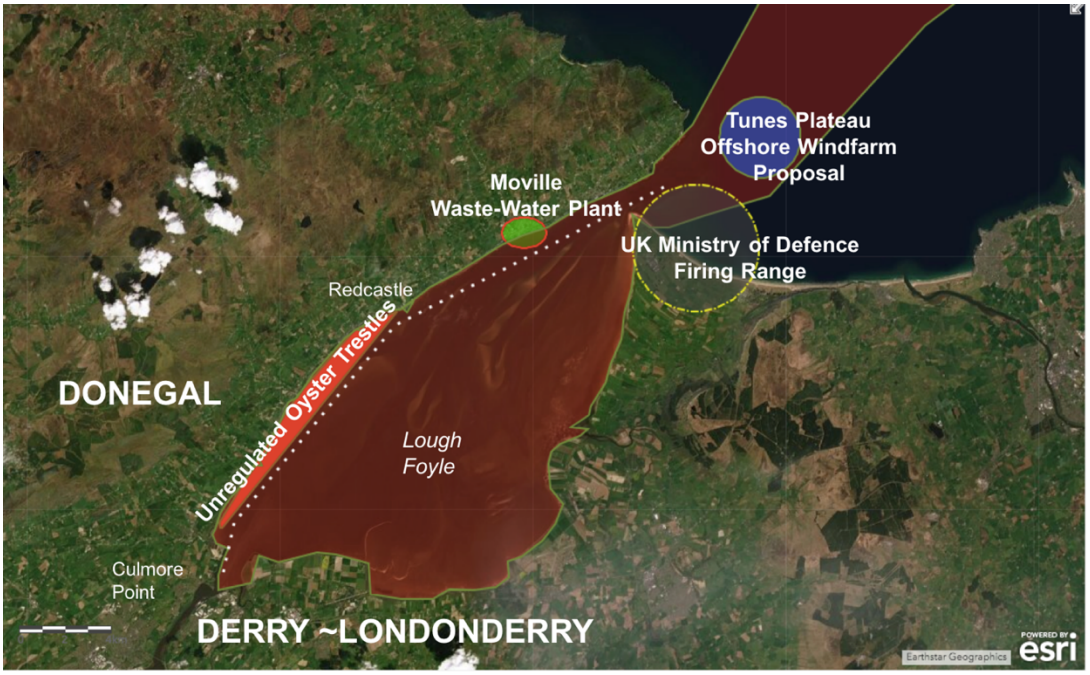


Figure 4.17: Map illustrating the geo-referenced conflict hotspots in Lough Foyle identified through a combination of the media analysis and the participatory mapping exercise with key informants during the semi-structured interviews. Key features include the scale of the unregulated oyster trestles spanning circa. 11km between Culmore Point and Redcastle and their proximity to the navigation channel (white-dotted line); the contentious waste-water plant at Moville; the abandoned offshore windfarm proposal just outside the mouth of Lough Foyle; and the UK Ministry of Defence army base firing range located at Magilligan on the eastern shore.

4.5. Lough Foyle Trajectory of Change Timeline

A synthesis of the data collated from the desktop research, the semi-structured interviews and media analysis is presented in Figure 4.18 as a Trajectory of Change Timeline (TOCT). The framing of resource conflict arising from a systematic analysis traces parallel transformation across government, industry, the research community and civil society linked to four seminal eras of change in the region:

1. Ireland- UK geopolitical revisions (1690- 1948).
2. Transboundary resource management in Lough Foyle (1953 to-date).
3. The Troubles in Northern Ireland (1968-1998).
4. Escalation of the ownership dispute and resource conflict (2002 onwards).

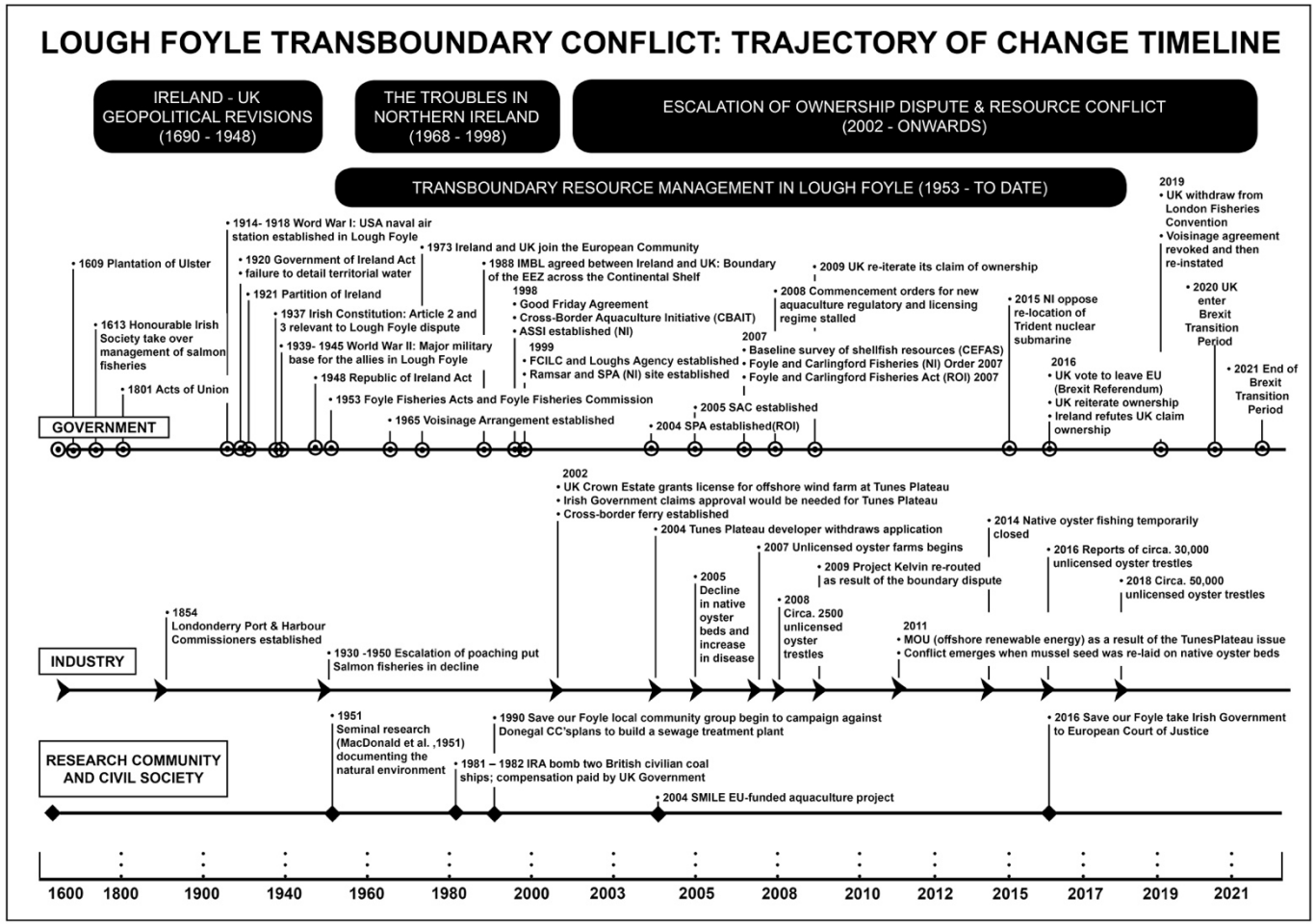


Figure 4.18: Lough Foyle Trajectory of Change Timeline: Unpacking complexity and tracing parallel changes in the governance responses from 1600- 2020. Based on data collated from desk review, media analysis and key informant interviews.

4.6 Discussion

Based on the primary and secondary data presented in preceding sections, this section critically analyses the interplay between the existing governance arrangements, historical legacy, geopolitical transformations and the current resource conflict from diverse perspectives. It begins with a discussion of the limits to the governability of the Lough Foyle ecosystem and an evaluation of the current governance system against Ostrom's (1990) principles for successful governance of common pool resources. This is followed by an analysis of the evolution of the resource conflict, an assessment of its escalation (Yasmi et al.'s (2006) and its links to the wider historical legacy and geopolitical context.

4.6.1 Limits to the governability of the Lough Foyle ecosystem

Governability challenges are embedded in the socio-ecological system-to-be-governed (section 4.2), the governance system (section 4.3) and the interactions between these systems (Chuenpagdee and Jentoft 2013). The existing marine governance system relevant to Lough Foyle is characterised by high levels of legal and institutional fragmentation separated by sectoral functions and a complex network of diverse state and non-state stakeholders from two jurisdictions operating at different scales. The mismatch between scale of the ecosystem and the corresponding legal and political system influences the capacity of the governance system to effectively manage the marine resources and deal with conflict.

In terms of institutional fit, Lough Foyle has a corresponding organisational structure at the appropriate geographic or ecosystem scale. The Loughs Agency has very specific sectoral objectives and regulates two geographic entities by transcending standard management structures (O'Hagan, 2011). It has a formal legal mandate with dedicated resources, both, financial resources and personnel which is co-funded by both jurisdictions. However, as highlighted in Figure 4.9, the remit of the Loughs Agency is limited to just a fraction of the sectors that operate within it. This limitation was raised by a number of key informants during the interviews.

Evidence from the interviews indicated that some key informants were not in favour of the current structure of the Loughs Agency's stakeholder participation mechanism (i.e. the Advisory Forum). When evaluated against the two of the core principles of good governance, it was alleged that the Advisory Forum was not particularly transparent with some stakeholders feeling that their expectations were not met and their input did not necessarily feed into decision-making processes. In terms of participation, the fact that membership was essential was deemed as limiting and the process should be more inclusive and flexible to facilitate the time constraints of stakeholders.

The responsiveness of the overall governance system (i.e. the Loughs Agency and all other institutions with a marine, maritime or environmental remit from both jurisdictions) to resource conflict in Lough Foyle has thus far failed to address the ongoing expansion of the oyster trestles. Numerous reasons for this failure have been identified in the interviews and include. Political inaction on the part of the Irish and UK Governments to agree on a boundary line or compromise through the introduction of a joint management scheme for aquaculture without formally agreeing on the maritime boundary. Whilst these bilateral boundary discussions occur at the highest level of Government between Dublin and London, the transboundary governance mandated to regulate the aquaculture sector on the front line in Lough Foyle, the Loughs Agency is powerless to address the conflict until such time as decisions are made and solutions are designed by Irish DFAT and the UK's FCDO.

EU membership for both the Republic of Ireland and the UK was a significant factor in the implementation of the GFA. It contributed to the establishment and funding of a host of multi-level governance, spatially- specific (e.g. BIC, NMSC) and sector-specific (e.g. Loughs Agency) arrangements between the Republic of Ireland and the UK and across the island of Ireland. The UK's final departure from the EU as of 2021 will signify a historic divergence for the two jurisdictions. Brexit has reignited the legacy of the conflict from Partition to the Troubles and the polarisation of political views on territory in Northern Ireland. Change and uncertainty are inherent with this

change in trajectory for the UK and as yet it remains unclear what repercussions this may have for the island in terms of geopolitics, economics and the environment, particularly in the shared loughs.

The potential for transformations of existing UK marine and environmental policies institutional structures post-Brexit have resulted in renewed calls for an integrated approach to transboundary governance in Lough Foyle. At present, there is a high level of convergence in marine and environmental legislation, for example through the transposition of nine EU Directives (Table 4.1). There is understandable concern that Northern Ireland's environmental policies may deviate from that of the Republic of Ireland following the end of the UK's Transition Period. In the case of Lough Foyle, different standards could potentially be in place for one shared ecosystem creating further challenges for good environmental status as well as the capacity of the Loughs Agency to monitor and mitigate threats.

According to the Loughs Agency, scientific evidence-based data informs all of their conservation regulatory and management decisions. Though the Loughs Agency is founded 50/50 by the Irish Government and the NI Executive, much of its research over the last decade or so has been funded through EU programmes. From one perspective, technically from 2021, only some of Lough Foyle will be a part of the EU and from another, all of Lough Foyle will now be part of the UK (a non-EU Member State).

Table 4.3 provides an evaluation of the current governance system in Lough Foyle against Ostrom's (1990) eight principles for successful governance of common pool resources. The premise of this evaluation was that each principle can provide insight into areas for improvement in the existing governance regime or next steps for more effective governance in the long-term. The results of the evaluation indicate that a number of the principles for common pool resource governance are incompatible with Lough Foyle's contextual complexities. Based on evidence from the case study, its applicability to contested marine ecosystems is questionable and it may be more appropriate for non-contested ecosystems. For example, the first principle states

that *the physical boundary of the natural resources along with a list of eligible and authorised users should be clearly defined.* The need for clearly defined boundaries is inherently problematic in a contested ecosystem.

The third principle states *stakeholders that depend on the natural resource should actively participate in decision-making processes*. Evidence from this case study identified that there are limited opportunities for stakeholders to participate in decision-making processes. In addition, if opportunities did exist, it is unlikely that stakeholders currently involved in unregulated, unlicensed aquaculture would be in favour of engaging with a government-led participatory mechanism. Likewise, it seems incongruous that government authorities would engage with these stakeholders as it may be perceived as a form of legitimising their activities.

The sixth principle relates to conflict resolution mechanisms and is arguably the most relevant for this study. It states that *mechanisms must exist in order that conflicts can be resolved quickly, cheaply and fairly*. This case study has not established any evidence of such a conflict resolution mechanism in Lough Foyle. The current resource conflict is entrenched in a complex geopolitical stalemate. Its resolution is beyond the scope of the Loughs Agency or the local stakeholders. Ultimately, the fate of the oyster sector will be determined by high level politicians far removed from the shores of Lough Foyle.

Table 4.3: Evaluation of Lough Foyle's current governance system with Ostrom's (1990) principles for successful governance of common pool resources.

Ostrom's (1990) principles	Description	Evaluation of the current Lough Foyle governance system
1: Clearly defined boundaries	The physical boundary of the natural resources along with a list of eligible and authorised users should be clearly defined.	Lough Foyle is a contested ecosystem and jurisdictional boundaries have never been formally agreed between the Republic of Ireland and the UK. Certain sectors and activities are regulated through the Loughs Agency (i.e. inland fisheries, shellfisheries and marine tourism) and the remaining by various Governmental institution from both jurisdictions. Aquaculture is currently not an authorised sector in Lough Foyle due to the ongoing ownership dispute.

2: Congruence between the environment and the governance structures	Those who derive benefits from use of natural resources should concomitantly contribute towards provisioning and maintenance activities. Such interventions should be tailored to local conditions to ensure long-term sustainability.	Lough Foyle has a fragmented governance framework with a multitude of legislation and institutions (e.g. environment, fisheries, tourism, energy) relevant to the marine ecosystem operating at sub-national, national, regional and international scales. The Loughs Agency has a limited remit covering only partial activities and sectors operating in the ecosystem.
3: Collective-choice arrangements	Stakeholders that depend on the natural resource should actively participate in decision-making processes.	There are limited opportunities for non-state stakeholders (i.e. industry, research community, NGOs and civil society) to participate in decision-making processes. Whilst the Loughs Agency Advisory Forum aspired to provide a transboundary mechanism for all stakeholders, evidence suggests that it is not meeting the expectations of relevant actors. It does not provide an open-door policy and membership is gained through a formal process.
4: Monitoring and evaluation	Monitoring and evaluation is vital to deter potential non-compliance by defaulters.	Scientific monitoring and evaluation of the marine environment and its resources is regularly carried out by the Loughs Agency. The unregulated and unlicensed oyster trestles are also monitored by drones regularly to record any new developments or hazards.
5: Graduated sanctions	All defaulters must be penalised for non-compliance and penalty increased according to the severity of the offence.	Those found to be engaged in illegal activities such as poaching, or polluting are penalised in different ways according to the severity of the offence based on the relevant regulations. The Loughs Agency do not presently have to powers to address the expansion of the unregulated and unlicensed oyster trestles which exist due to a legal loophole.
6: Conflict resolution mechanisms	Mechanisms must exist in order that conflicts can be resolved quickly, cheaply and fairly.	Ownership of Lough Foyle and Carlingford Lough loughs is disputed and boundaries are absent in both; These disputes are managed through cross-border governance mechanisms through the GFA. The Loughs Agency is unable to resolve resource conflicts associated with the ownership dispute as this is beyond its remit. Presently, due to the legal loophole whereby stakeholders are unable to get a license to operate in Lough Foyle from either the Loughs Agency or the respective authorities on both sides (DAFM in the Republic of Ireland and DAERA in Northern Ireland) the oyster conflict can only be resolved if there is some form of agreement between the UK's Foreign Commonwealth Office and the Irish Dept. of Foreign Affairs and Trade.
7: Minimal recognition of rights to organise	Natural resource users must be given some degree of freedom and flexibility to organise themselves to enhance	There is evidence from the interviews and media reports that local stakeholders have mobilised in response to the unregulated and unlicensed trestles media reports in relation to their environmental and visual impacts.

	relevance, applicability of rules and norms	
8: Multi-layered nested framework	For larger resource systems, rules are embedded and enforced within a multi-layered nested framework for easy coordination, networking and being responsive to specific situations	A multi-layered framework currently exists for Lough Foyle, but it is fragmented and lacks an overall integrated multi-sector structure. The limited remit of the Loughs Agency for certain sectors is a step in the right direction but does not go far enough in terms of the scale of the resource users in the region.

4.6.2 Evolution of the resource conflict and its links to the wider historical legacy and geopolitical context

Applying a multi-perspective framing approach has allowed for a more comprehensive understanding of the case study context and an awareness of the description within which the conflict is embedded (Kriesberg, 2001). Looking to the past to establish the unique historical and geopolitical context within which the resource conflict has unfolded has been essential to understanding the status quo in Lough Foyle.

Development of the Trajectory of Change Timeline (Figure 4.18) facilitated the systematic analysis of the linkages between external geopolitical transformations, the multi-scalar governance interactions and the limited progress made to-date towards resolving the both the maritime dispute and the oyster conflict. The Trajectory of Change Timeline synthesises intricate connections between different expressions of power and influence and emphasises how both jurisdictions are historically linked across all four eras of change. The Partition of Ireland and the failure to delimit the maritime boundaries in the transboundary Loughs, the establishment of the Foyle Fisheries Commission as a transboundary governance mechanism, the legacy of the Troubles and the subsequent GFA, and the UK's decision to the withdraw its membership of the EU are major flashpoints for Lough Foyle.

GIS mapping (e.g. 4.6, 4.17) and photography (e.g. Figure 4.15 and 4.16) provided visual clarity in terms of the scale of the expansion of the oyster trestles (circa. 11km in length) on the western shores of Lough Foyle within a designated SPA. GIS mapping also highlighted the asymmetrical geography of the navigational channel and the severity of the problem in terms of the proximity of the trestles to this channel.

When evaluated against Yasmi et al.'s (2006) continuum of conflict escalation in natural resource management, the oyster conflict in Lough Foyle has progressed through a number of stages. Since the trestles first started to be erected from 2007-2008, the degree of conflict has escalated from critique of open debate in the local community and critique of government policy not to intervene (stage two), to lobbying Governments and local public protests on the Inishowen peninsula (stage three and four). There have been no reports of restrictions imposed by other stakeholders to access the resource (stage five), legal cases to-date (stage six) or escalation to physical violence (stage seven). However, from 2016 onwards, the oyster conflict has been gained national and international media attention (e.g. print and online media and television) as an indirect result of Brexit reviving debates surrounding the unresolved maritime dispute. Despite this national and international publicity (stage 8), as of 2020, the oyster conflict continues, and the jurisdictional status of Lough Foyle remains in limbo.

4.7 Re-framing the conflict

In terms of framing, this study supports previous work and demonstrates that the failure to delimit a boundary in Lough Foyle is ultimately a consequence of legal ambiguity dating back to a century ago (Ritchie et al., 2019; Flannery et al., 2015; Symmons, 2009). The geographical asymmetry and the location of the navigational channel adjoining the Irish coastline, which is critical for access to Foyle Port in Northern Ireland, further obscures the matter. Added to this, the current stalemate pivots around polarised and fixed territorial perspectives relating to geopolitical beliefs both on the island of Ireland and the UK Government.

At the core is the potential socio-political and economic implications of boundary delineation for different sectors and communities across Lough Foyle. This case study supports Campbell (2017) in that issues of ownership cannot be separated from issues of governance. The GFA is premised on a framing of the Northern Ireland conflict (i.e. the Troubles) as being a (terrestrial) border conflict.

When assessed against Hisschemöller and Hoppe's (2001; 1995) problem complexity framework, the oyster conflict which is embedded in a legally ambiguous ownership dispute can be categorised as a 'structured' or 'untamed political problem' where a high degree of consensus or certainty exists in relation to relevant data and information. However, conflict exists and has prevailed over a long period because stakeholders (i.e. Irish and UK Government, local populations on either side of Lough Foyle) frame the problem from different perspectives. Technical solutions exist (e.g. using the median line) but their application will ultimately be met with societal conflict and blocked by stakeholders due to geo-strategic access issues and the legacy of geopolitical sensitives linked to history of contested sovereignty on the island of Ireland. For example, application of the median line would mean that a UK vessel (particularly following Brexit) would have to enter an EU territory via the only available navigation channel to travel to Lisahally port in Derry~Londonderry in Northern Ireland.

4.8 Future governance options

The following evidence-based future governance options are sensitive to the wider historical context and align with current geopolitical realities across Lough Foyle, the island of Ireland and the United Kingdom.

(i) Breaking the geopolitical deadlock during the current political climate

The case of Lough Foyle demonstrates how transboundary marine governance is inherently a political process determined ultimately by broader historical and geopolitical contextual factors. Despite a series of bilateral discussions in the past decade, no progress has been made and both Governments are nowhere near consensus with regard to Lough Foyle. An issue identified in this case study is the

scale of the problem; oyster farming is not significant enough in terms of relative economic value to be a considerable lobby force. Due to the complexities and longevity of the ownership dispute, there is no immediate ready-made solution to solve this problem. The current political climate with the final phases of Brexit looming means that realistically it is not a high priority for either Government.

When evaluated against existing models of cooperation intensity (Waisová, 2013; Sandwith et al., 2001; Zbicz, 1999a; 1999b), empirical findings from Lough Foyle highlight contradictions including: non-cooperation and strategic political inaction in terms of addressing the oyster farms; weak cooperation in terms of resolving the ownership dispute; and integrated cooperation with limited sectors managed on a transboundary basis by the Loughs Agency.

'If the political will exists between the affected parties, then resolution should be achievable for any given dispute' (Smith and Thomas, 1998:27). A resolution does not necessarily require a compromise on ownership or delimitation of a boundary line in Lough Foyle. An alternative option is to proceed with the implementation of a joint management scheme at the scale of the ecosystem as originally envisaged when the Loughs Agency was established. Such a scheme would not jeopardize either jurisdiction's boundary claims, but it would activate a regulatory environment whereby licensed oyster farmers would be the only stakeholders legitimately authorised to operate in Lough Foyle. Due to their location, there are currently many navigational risks and hazards associated with unregulated and unlicensed aquaculture activity on non-native Pacific oysters. Evidence from this study that there is an urgent need to halt the expansion of the trestles due to the uncertainties surrounding the impact that may have on native oysters and other marine resources.

(ii) *Proactively engaging with the oyster sector in preparation for a new licensing regime*

This study identified that there are different types of Pacific oyster operators currently operating in Lough Foyle; experienced, professionals with licensed farms in other locations in Donegal and those characterised by a border mentality which

optimises on loopholes for economic gain with little experience in the sector. A primary concern for the Irish Government in terms of enforcement should be that existence of trestles within the SPA. Under the Habitats Directive (Article 6 (3)), any type of proposed development within proximity of a designated conservation site should not adversely affect the integrity of the site concerned (i.e. the coherence of the ecological structure and function, across a site's whole area, that enables it to sustain the complex of habitats and/or the levels of populations) (Article 6 (3)). If this type of development had transpired in another designated site, the consequence would almost certainly be a substantial fine or imprisonment. However, due to the legal loophole in Lough Foyle, this enforcement tool has not been imposed.

The Loughs Agency have estimated that the oyster sector in Lough Foyle is worth €22 million annually if regulated correctly. BIM (2019) report a national figure of €44.3 million for Irish Pacific oyster production. The appropriate regulation of Lough Foyle aquaculture could therefore substantially impact the overall export trade volume to European, Asian and other markets. This in turn could have a knock-on effect to the local economy in terms of enhanced business opportunities and employment. It is therefore critical that an engagement process is designed to pre-empt the conflict that is likely to emerge once a new licensing regime has been approved. Following their 'land grab', existing operators are likely to claim 'squatters' rights' and resist any effort to remove their trestles. It is also essential that a clear roadmap and strategic plan is developed in consultation with stakeholders for them to apply for the relevant permits and licenses under a new regulatory regime.

All future developments will need to comply with good practice such as, strategic planning of oyster trestles which conform to requirements in line with carrying capacity, Appropriate Assessments and Environmental Impact Assessments; are congruent with the navigation channel and ensure coexistence with native oyster beds, thus reducing and preventing conflict with other marine users. Early and effective engagement with stakeholders will help to promote compliance and mitigate defiance to the new rules through potential protests or blockading access to the sites.

(iii) Review of existing transboundary governance mechanisms to enhance opportunities for stakeholder participation

Results from the interviews indicate there is a need to conduct a systematic review of the existing institutions to evaluate their success to-date in relation to their current remit and associated objectives. This evaluation would identify existing gaps in governance and possible areas to improve.

At present, from the perspective of ecosystem-based governance, the extremely specific remit of Loughs Agency does not match with the diversity of stakeholders. Ideally the responsibilities of a transboundary governance institution should incorporate all human influences into its working model. This would entail expanding the current focus beyond inland fisheries, shellfisheries, aquaculture and marine tourisms to include all stakeholders (as illustrated in Figure 4.9). The long-term sustainability of the ecosystem would benefit from a more holistic and integrated approach to Lough Foyle and its wider catchment ecological unit (i.e. fresh-water, estuarine, coastal and marine management).

From a stakeholder participation perspective, the establishment of an annual Lough Foyle forum or conference could provide an opportunity for stakeholders from both jurisdictions to meet face-to-face, network and hear about issues, concerns and opportunities from different perspective. This type of interaction can foster more collaborative partnership that transcend sectoral and political boundaries and encourage multi-sector solutions to common challenges.

4.8 Conclusion

The case of resource conflict in the contested waters of Lough Foyle is exemplified by the legacy of colonialism and Partition, violent conflict as a result of the Troubles. The unique historical and geopolitical context has exacerbated economic disputes in this protracted border bay dispute. In addition, this case study has highlighted how the realities of day-to-day coastal and marine operations in Lough Foyle are geographically and political peripheral to the key decision-makers. While ambiguity about ownership prevails, the oyster sector continues to capitalise on this divergence

in claims and the number of trestles expand each year. In the absence of a political appetite to tackle the resource conflict or come to some form of an agreement on the boundary, the Lough Foyle ecosystem will continue to be a casualty of the deadlock

Chapter 5: The Palk Bay case study

This chapter applies the analytical framework presented in chapter two (Figure 2.7) and presents the second of the in-depth case studies. Palk Bay represents a study site from the Global South located within the territorial seas and the findings address the second research objective: *establish a multi perspective baseline of information on resource conflicts stemming from case studies of contested marine ecosystems.*

5.1 Introduction

In north-eastern part of the Indian Ocean, eight countries in South and South East Asia share the coastal and marine resources across the extensive area of the Bay of Bengal Large Marine Ecosystem (BOBLME); India, Sri Lanka, Maldives, Bangladesh, Myanmar, Thailand, Malaysia, and Indonesia (Figure 5.1). Six areas[30] within the BOBLME have been identified for their substantial significance in terms of biological diversity, and one of these, Palk Bay, with its extensive sea grass beds and coral reef systems (FAO, 2016), is the focus of this chapter. Palk Bay, located in the south of the Bay of Bengal, is a transboundary semi-enclosed sea separating the coastal regions of Tamil Nadu in southern India from northern parts of Sri Lanka. Its name can be traced back to colonial times, after Robert Palk, the English Governor of Madras during the mid-eighteenth century, during the rule of the British East India company over parts of India (Overton, 2019).

Set within the broader study, the objectives for the Palk Bay case study were to apply the analytical framework (Figure 2.7) to: (i) establish a multi-perspective baseline of information on the resource conflict (ii) critically analyse the interplay between the existing governance arrangements, historical legacy, geopolitical transformations and the current resource conflict from diverse perspectives, in order to (iii) re-frame the resource conflict and (iv) formulate empirically-based insights for future governance options within the context of current geopolitical realities.

[30] The other areas are the Sundarbans (one of the world's most extensive mangrove systems); the Gulf of Mannar; the Marine (Wandur) National Park in the Andaman and Nicobar Islands; the Maldives Atolls; and Mu Ko Similan National Park and Mu Ko Surin National Park in Thailand.

In terms of structure, this chapter broadly follows the sequence of the case study objectives. It begins with an overview of the resource conflict and the contested boundary, the socio-ecological system to be governed and the existing governance system (sections 5.1.1- 5.3). This is followed by the results of the literature review specific to Palk Bay, the media content analysis, 21 semi-structured interviews with key informants, and the participatory mapping exercise of conflict hotspots (section 5.4). A synthesis of the results is presented in the form of a Trajectory of Change Timeline (section 5.4). Based on the primary and secondary data presented in the previous sections, the interplay between the existing governance arrangements, historical legacy, geopolitical transformations and the current resource conflict are analysed (section 5.5). The chapter concludes with the re-framing of the resource conflict (section 5.6) and a series of empirically-based insights for future governance options in the region (section 5.7).

5.1.1 Overview of the resource conflict and the contested waters of Palk Bay

IUU (illegal, unreported and unregulated) fishing is a global phenomenon which also significantly impacts the Bay of Bengal through the overexploitation of fish stocks (Sumaila et al., 2020; Petrossian, 2015; Agnew et al., 2009; 2008; Pramod et al., 2008). IUU fishing contributes to the depletion of fish stocks and degradation of marine ecosystems which results in reduced catches for vulnerable coastal communities and undermining their food security and livelihoods. In a 2015 assessment, BOBLME showed that the total value of illegal fishing catches was between $3 and $5 billion annually and unreported fishing could be valued between $2.7 billion and $1.35 billion annually (Hoon et al., 2015). Disputes over fishing rights and access to marine resources, have undermined the rule of law and heightened tensions between countries, especially for those that rely heavily on fishing for food or income (National Intelligence Council, 2016).

Figure 5.1: Map illustrating the location of Bay of Bengal LME with the eight surrounding countries including Palk Bay separating southern India and northern Sri Lanka. (Source: The author).

Sri Lankan and Tamil Nadu fishermen had been operating in Palk Bay for a long period prior to the delineation of international maritime boundary lines (IMBL) from 1974 to 1976. After the formal ratification of the IMBL by both countries, traversing the boundary for the purposes of fishing in the neighbouring jurisdictions was prohibited. Despite this agreement, Palk Bay has evolved into a highly contentious transboundary marine body with intense hotspots of conflict relating to IUU fishing, stock depletion and environmental degradation by Tamil Nadu trawlers on the Sri Lankan side of the border.

Since the 1980s, the scale of the conflict is stark as a fleet of 1500- 2500 or more industrial trawlers have continually transgressed Sri Lankan waters by night at least three times each week (Kularatne, 2020). According to Dodangodee (2017) 35,600 trawlers engaged in IUU fishing in Sri Lanka in 2016 landing 1,900 tonnes of prawns and 4,000 tons of demersal species. This has resulted in over 3000 arrests (some fishermen have been arrested and released multiple times) and more than 800 boat detainments by the Sri Lankan navy (Vincent, 2020; Scholtens, 2016b). It has also been alleged that over 300 Tamil Nadu fishermen have been injured by shootings and 85 have been killed

by the Sri Lankan navy in recent decades (Vincent 2020; Dodangodee, 2017; Zacharia, 2015).

5.2 Socio-ecological system-to-be governed

This section outlines the basic features of the socio-ecological system-to-be-governed for the Palk Bay marine ecosystem.

5.2.1 Indo-Sri Lankan geopolitical maritime relations

Both countries have a recorded history of more than 2,500 years built upon a legacy of cultural, linguistic and religious discourse (Amrith, 2003). During the British colonial period (1858- 1948), the first attempt to establish a 'Fisheries Line' demarcating the waters (but not the boundary) between the two colonies was in 1921 in a bid to 'avoid over-exploitation' and to 'take measures for the conservation of the marine resources' (de Silva, 2008: 2-3). The island of Kachchathivu was a bone of contention during the negotiations with Sri Lanka claiming historical religious ties and India declaring that the Tamil Nadu government also claimed territorial ties. It was agreed that the Fisheries Line would run west of Kachchathivu (in favour of Sri Lanka) and compensation would be granted elsewhere for India so as to maintain 'an equitable apportionment in the fisheries domain' (de Silva, 2008: 2-3). Since they both fell under British rule at that time, the issue of sovereignty or ownership of marine resources did not arise (Manoharan and Deshpande, 2018; Suryanarayan, 2005).

India gained autonomy and independence from the British Empire in in 1947 and Sri Lanka, (formerly British Ceylon) in 1948. Since the existing Fisheries Line established during the colonial period was un-ratified, there was a joint desire for a more formal demarcation of the maritime boundaries between the governments. Conflict emerged again in relation to Kachchathivu when Sri Lanka considered the 1921 Fisheries Line as a territorial demarcation which India opposed (Suryanarayan, 2005). The 1974 international maritime boundary agreement was subsequently based on a modified equidistance line whereby the line runs one nautical mile west of Kachchathivu (Figure 5.2), ceding it to Sri Lanka (Manoharan and Deshpande, 2018; Jayawardena, 2013).

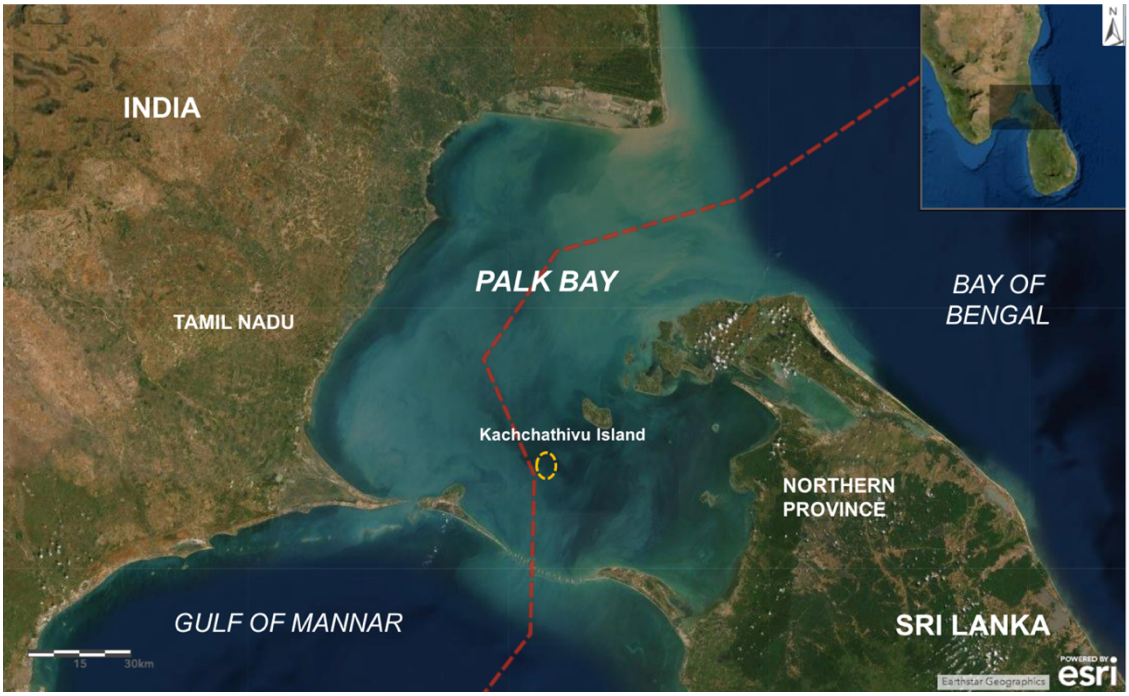


Figure 5.2: Location of the contentious Kachchathivu Island close to the IMBL in Palk Bay. (Source: The author).

Manoharan and Deshpande (2018) argued that two special clauses were attached to the agreement that have impacted the current conflict: Article 5 provided for the continuing use of Kachchathivu for pilgrimage and for drying nets and fish. Article 6 granted the free movement of vessels in Palk Bay as before (however fishing is not explicitly mentioned in the text).

In 1976, Sri Lanka enacted the Maritime Zones Law, No. 22 of 1976 which extended the boundary line of the Palk Bay area in the Gulf of Mannar area (288 nautical miles) on one side and in Bay of Bengal (214 nautical miles) on the other. In 1977, India enacted the Indian Territorial Waters, Continental Shelf, Exclusive Economic Zones and Other Maritimes Zones Act, No. 80 of 1976 (Jayasinghe: 2003). The historic waters in the Palk Strait and Palk Bay were declared as part of internal waters while those in the Gulf of Mannar were declared as part of the territorial sea (Hettiarachchi, 2007). The text of these various IMBL agreements between Sri Lanka and India are available in Appendix 3.

These maritime boundary negotiations were conducted solely at a bilateral level between governments and fishermen from neither were consulted at any point in these

boundary demarcation processes (Manoharan and Deshpande, 2018). Furthermore, the retrieval of the island of Katchatheevu and restoring the fishing rights in Palk Bay remain a priority for both the Tamil Nadu political party Dravida Munnetra Kazhagam (DMK) and the current ruling party, the All India Anna Dravida Munnetra Kazhagam (AIADMK) (Vincent, 2020; Stephen et al., 2013). However, this agenda is neither shared nor supported by the Indian central Government.

5.2.2 The marine geography of Palk Bay

This region encompasses an enclosed sea delimited by the Indian coastline to the west, and Sri Lanka's coastline to the east. Separated by a distance of just 30km, the total bay area is approximately 17,000km^2. A chain of shoals, (the Adams or Rama Bridge), divides Palk Bay from the Gulf of Mannar to the south and the Bay of Bengal to the northeast (Figure 5.3). It is a shallow basin with an average depth of nine metres and 16 metres at its deepest point (Scholtens and Bavinck, 2013; Sivilingam, 2005). A shared common pool of resources emanates from a single ecosystem with diverse ecological functions and processes occurring across the IMBL. The latest census data available from both countries indicates a combined coastal population close to 5.4 million people (Government of India, 2012; Government of Sri Lanka, 2012).

Figure 5.3: Map illustrating the proximity of IMBL in Palk Bay, the key districts on both sides and the Tamil Nadu trawler centres. (Source: The author).

As demonstrated in Figure 5.3, although five Tamil Nadu coastal districts border Palk Bay, only three (Ramanthapuram, Pudukkottai, and Nagapattinam) exert considerable influence on the fisheries sector. Four (out of a total of 12) key trawler centres involved in the conflict are represented; Rameswaram, Mandapam, Kottaipattinam and Nagapattinam. Nagapattinam only covers a minor section of the coastline. Ramanathapuram and Pudukkottai combined account for almost 70% of the coastal area and rank amongst the poorest districts in Tamil Nadu and the highest in terms of livelihood dependency on fishing (Salagrama, 2014). On the Sri Lankan side, fishing activities in the Northern Province primarily occur in Jaffna, Kilinochchi and Mannar (Scholtens, 2015).

5.2.3 Biodiversity

In the south-west part of Palk Bay, a substantial coral reef (with over 63 species of coral) extends along the coast from Mandapam to Rameswaram and also further south, in the Gulf of Mannar (Marimuthu et al., 2020; Marimuthu et al., 2016; Manikandan et al., 2016). The Palk Bay ecosystem hosts diverse species including molluscs, crustaceans and finfish (Joseph, 2003). The shallowness of the bay results in a photosynthetically rich seabed which has given rise to a culture of specialised practices from coastal fishing communities. There are a number of shared stocks including Indian mackerel, Oil sardine, Little tuna and Spanish mackerel (Willman, 2003; Sampath, 2003).

From a commercial perspective, prawns, sea cucumbers and other demersal species are primarily targeted (Scholtens, 2015) and trawling is the dominant gear. The region has been experiencing escalating ecosystem degradation as a result of overfishing, bottom-trawling and the impact of pollutants on water quality from land-based coastal development specifically on the Tamil Nadu side (Kasim, 2015). In Indian waters, a number of species such as catfish and sea turtles have reportedly disappeared and ray and lobster have declined (Vivekanandan and Kasim, 2011). Correspondingly in Sri Lankan waters, fishers have observed declining catches and rely on an increasingly limited number of low value species such as sardines (Vivekanandan and Kasim, 2011).
Palk Bay is home to a remnant but still breeding population of marine mammals, dugongs linked to the presence of dense seagrass beds. Historically the region harboured a much larger population of dugongs that is now small (Balaji, 2017). The

dugong is listed as vulnerable in the International Union for Conservation of Nature (IUCN) Red List and its conservation status is critical with less than 300 remaining in South Asia. As a result, the Palk Bay population is critical for the long-term survival of dugongs in the wider region (Balaji, 2017; Sivakumar and Nair, 2013; Pandey et al. 2010). Although both the Government of India and the Government of Sri Lanka have legally protected dugongs, the species still face multiple pressures throughout Palk Bay due to the land-based sources of pollution (Kaly, 2004; Sampath, 2003), and fishery entanglements (Di Sciara et al., 2016) due to the intensity and scale of bottom trawling (Kularatne, 2020; Stirrat, 2018; Sampath, 2003).

On the Sri Lankan side where the IUU fishing occurs, extensive lagoons, mudflats, sandflats, seagrass beds and shallow shores, are among the most important areas for migrating sea birds (Kotagama and Bambaradeniya, 2006). The Vankalai Sanctuary (Ramsar site) in Mannar is home to over 20,000 seabirds during the migratory season. On the northern periphery of Palk Bay, in Tamil Nadu, 257 species of birds have been recorded at the Point Calimere Wildlife and Bird Sanctuary (Ramsar sites); 119 of these are seabirds including vulnerable species such as the Spoonbill Sandpiper and the Grey Pelican (Arauah, 2005).

There are 11 wildlife protected areas in coastal districts of the Northern Province (Mannar, Jaffna, Kilinochchi and Mullaitivu) that are of great importance to the wider marine ecosystems (Northern Province Sustainable Fisheries Development Project, 2018; Gunatilleke et al., 2017). They provide important spawning and feeding grounds for juvenile fish species such as trevally, snappers and also host a number of threatened species, such as the green turtle and saltwater crocodiles (Gunatilleke et al., 2017).

5.2.4 Socio-economic profile of Palk Bay

For centuries, the Bay of Bengal was crossed by traders, troops, slaves and plantation workers. This movement was exceptionally intense in Palk Bay during imperial times when large numbers of migrant workers were uprooted and mobilised (Amrith, 2013; Mukund, 1999). Nowadays, cross-bay movement is restricted by the lack of a ferry service, limited rail and expensive air linkages. The legacy of cross-bay migration has resulted in cultural homogeneity across Palk Bay. Trawling and small-scale fishing is

exclusively carried out by Tamil-speaking fishers from both sides of the IMBL (Stephens et al., 2013) sharing a common ethnic identity (Scholtens, 2015; Gupta, 2007;) and coexisting in the fishing grounds for centuries (Suryanarayan, 2005).

Tamil Nadu tourism is the second largest industry in India with an annual growth rate of 16% and 9.4% in the Ramanathapuram district, adjoining the Palk Bay region (Priya and Radhakrishnan, 2015). Pilgrimage based coastal tourism is the main economic activity in the coastal zone. In particular, Rameswaram (the main trawler centre) is a significant pilgrimage destination for many Hindus and according to most current available data, had 7.7 million tourists in 2014 (Priya and Radhakrishnan, 2015; Government of India-Ministry of Tourism, 2014).

The shallow waters make Palk Bay unsuitable for shipping, but ideal for fishing, which is the mainstay of the economy of the region. Table 5.1 outlines the asymmetry between the neighbouring jurisdictions in terms of demographics and fishing capacity. These differences have arguably contributed to an escalation in the conflict, particularly since 2009, when tensions began to heighten (Scholtens 2016a; Stephen, 2015; Stephen et al, 2013; Vivekanandan, 2011; 2010).

Table 5.1: Comparative demographics and key socio-economic indicators across Palk Bay.

		Palk Bay	Tamil Nadu	Northern Province
Length of coastline		694km	294 km	400 km
Population by district **Total population**			1,353,445 Ramanathapuram 1,618,345 Pudukkottai 1,616,450 Nagapattinam	583,882 Jaffna 113,510 Kilinochchi 99,570 Mannar 92,238 Mullaitivu 172,115 Vavuniya
		5,385,202	**4,588,240** (2011)	**1,061,315** (2012)
Fisher folk population		**352,365**	**307,445**	**44, 920**
Tamil ethnicity/ Primary language			74%	94%
No. of Fishing villages		468	268	200
No. of Fish landing centres		332	161	171
Marine fish production (metric tonnes)		262,878	204,113 (63% by trawlers)	58,765
Semi-industrialised	**No. of Trawlers/ (Horsepower- HP)**	**2706**	**2507** (70-190 HP)	**199** (>50HP)
Small-scale boats	**No. of Motorised** **No. of Traditional**	13,159 6737	5386 3790	7773 2947
	Total small-scale fleet	**19,896**	**9176**	**10,720**

Sources: Government of India (2012); Government of India (2014); Government of Tamil Nadu (2015); Scholtens (2016a; 2016b); Government of Sri Lanka (2012); Ministry of Fisheries and Aquatic Resources Development (2016); Northern Provincial Council (2014) Central Bank of Sri Lanka (2015); Premawardana (2010).

Whilst more recent data is not publicly available, Salagrama (2014) reported that employment in the Tamil Nadu fisheries sector has increased greatly in recent decades, with a 68% increase from 2000 to 2010. Trawlers based in this region alone account for 43% of Tamil Nadu's total fleet (Figure 5.4). The significant levels of technological

capacity in the Tamil Nadu fish landing centres along Palk Bay mirrors similar scenarios at both a state and national level (Table 5.2).

Table 5.2. The scale of excess capacity in relation to optimum projections for the Tamil Nadu and national fishing fleet. (Adapted from Infantina et al. (2016).

Vessel type	**Tamil Nadu capacity**	**Indian capacity**		
	Optimum*	Actual**	Optimum*	Actual***
Trawlers	4,333	5,767	10,998	35,228
Motorised	12,689	22,4781	14,862	71,313

Sources: *Kurup and Dervaray (1999); **Government of India (2011); ***Government of India (2012).

Figure 5.4: Images of the Tamil Nadu fishers and trawlers based in Rameswaram, December 2015 (Source: The author).

Sri Lanka's Northern Province is home to more than one million people, 93% of whom are Tamil (compared to 4.2% of the total Sri Lanka population). The province includes five districts—four of which border the sea; Jaffna, Mannar, Kilinochchi, Mullaitivu, and Vavuniya which is landlocked. The legacy of the civil war between the Sri Lankan

government and the Liberation Tigers of Tamil Eelam (LTTE) from 1983 to 2009 is still very present today. Sri Lankan's Northern Province has the highest incidence of poverty (e.g. Mannar and Mullaitivu at 20.1% and 28.8% respectively, compared to 6.7% nationally) and unemployment (25%) compared to all other regions in the country (Department of Census and Statistics, 2019).

The civil war had a considerable impact on the country's tourism industry (Fernando, 2017; Buultjens et al., 2015). In particular, coastal tourism in the Northern Province has been impeded by political instability and political interferences (Sivesan, 2017) which only came to an end just over a decade ago. Until early 2015 (just before the fieldwork conducted for this study), tourists had to receive written permission from the Ministry of Defence to travel to the northern war-torn parts of Sri Lanka. Unlike the Tamil Nadu side of the bay, which is a primary pilgrimage destination and provides an alternative form of employment for the local population, economic activity on the Sri Lankan sides has traditionally been limited to subsistence fishing and agriculture.

The fisheries sector provides livelihoods for more than 40,000 families in the Northern Province (Ministry of Fisheries and Aquatic Resources Development, 2016). Prior to escalation of the civil war, the Northern Province, which has 40% of the nation's coastal belt, accounted for 30- 40% the country's total fish production (Scholtens, 2016a). The Province's fish catch dropped considerably during the conflict, and even if there has been a slight recovery since, it has not returned to its previous level (FCG ANZDEC, 2017). At present, fishing in the region is predominantly small-scale (Figure 5.5), compared to the semi-industrialised trawling fleet that operates in Tamil Nadu. Common practices include coastal gillnet fishing, purse seining, and beach seining. Jaffna and Mannar are home to a fleet of just under 200 aging trawlers that target sea cucumber and prawns (Scholtens, 2016a).

Figure 5.5: Images of Sri Lankan Tamil fishers practicing coastal seining in Mannar, December 2015 (Source: The author).

5.3 Existing governance system

This section outlines the current governance regime in place for the transboundary Palk Bay ecosystem. This includes an overview of the key marine legislation, policies and institutional arrangements relevant to both countries at international, regional (i.e. South Asia), national and sub-national scales. Stakeholders relevant to the Palk Bay socio-ecological system are represented by a host of diverse institutions and organisations representing different governance domains at various scales in both countries ranging from the local, to state/provincial, national and bilateral scales.

Most international commitments are met through national laws, many of which have a bearing on aspects marine resource management across Palk Bay. Table 5.3 provides of summary of the most relevant legal and policy instruments at an international and regional scales. Both India and Sri Lanka have ratified all of these marine environmental and fisheries treaties with the exception of the 2009 Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated (IUU) Fishing (PSMA). Whilst Sri Lanka has been a signatory to the Agreement since it was established, to-date India has not. From an EU perspective, this raises question for the

legality of imports of fishery products from India and even more so in the case of illegal incursions by the Tamil Nadu trawler fleet in Sri Lankan waters.

Table 5.3: International and regional Legal and policy instruments relevant to transboundary marine resource management and the protection of the Palk marine environment.

		STATUS	
Legal instrument	**Relevance to Palk Bay**	**India**	**Sri Lanka**
Convention on Wetlands of International Importance 1977 (RAMSAR)	Ramsar sites on both sides of the IMBL; Vankalai Sanctuary in Mannar and Point Calimere Wildlife and Bird Sanctuary.	Yes	Yes
Convention on the International Trade in Endangered Species of Wild Fauna and Flora 1973 (CITES)	Declining population of dugongs, marine turtles.	Yes	Yes
Convention on the Conservation of Migratory Species of Wild Animals 1979 (CMS), MOU on the conservation of marine turtles, dugongs (2001; 2007).	Declining population of dugongs, marine turtles.	Yes	Yes
United Nations Law of the Sea Convention (LOSCS) 1982	Obliged to cooperate in managing shared living resources and coordinate protection of the marine environment and scientific research; Requires signatories to peacefully resolve their maritime conflicts.	Yes	Yes
Convention on Biological Diversity 1992 (CBD)	Conservation, sustainable use, and fair and equitable sharing of the benefits arising from 302 species of marine algae, 580 fish species of fishes, five marine turtle species and 11 seagrass species and several species of mangroves.	Yes	Yes

International Convention for the Prevention of Pollution from Ships 73/78 and Annex 1 1973 (MARPOL)	Protection of the marine environment from oil and other harmful substances.	Yes	Yes
United Nations 2030 Agenda for Sustainable Development 2015	Foster peaceful, just and inclusive societies which are free from fear and violence; Protect the planet from degradation, including through sustainable consumption and production, sustainably managing its natural resources.	Yes	Yes
United Nations Food and Agriculture Organisation (FAO) Code of Conduct on Responsible Fisheries 1995 (CCRF)	Voluntary code based on LOSC setting out principles and standards applicable to the conservation, management and development of all fisheries including aquaculture.	Yes	Yes
United Nations Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks 2001 (UN Fish Stocks Agreement)	Ensure the long-term conservation and sustainable use of straddling and highly migratory fish stocks within the framework of LOSC.	Yes	Yes
Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated (IUU) Fishing (PSMA) 2009	Prevent, deter and eliminate IUU fishing by preventing vessels engaged in IUU fishing from using ports and landing their catches.	**No**	Yes
Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO) and Agreement	Enhance cooperation in the region and provide technical and management advisory services for sustainable marine fisheries development and management, with a focus on small-scale and artisanal fishers.	Yes	Yes

A wide range of government institutions are linked to marine activities and environmental management on both sides of Palk Bay. Table 5.4 (India and Tamil Nadu) and Table 5.5 (Sri Lanka and the Northern Province) provide an overview of the various

institutions (and stakeholders) involved (to different degrees) in decisions-making in the region according to their sector (e.g. environment, fisheries, aquaculture, renewable energy etc.). They also list the supporting legislation or policy and describe their specific relevance for the governance of marine resources and activities in Palk Bay.

Table 5.4: India and Tamil Nadu: Legal, policy and institutional arrangements for marine governance in Palk Bay

Sector/ Government level	**Legislation/ Policy**	**Relevance to Palk Bay**	**Institution / Government stakeholder**
Foreign Affairs (Central Government)	Joint Working Group (JWG) with Sri Lanka established in 2005; Proposal for an MOU on joint cooperation on fisheries	JWG bilateral mechanism to resolve the Palk Bay conflict.	Ministry of External Affairs
Environment (Central Government)	Wild Life Protection Act of 1972 (WLPA)	Protect threatened species, national sanctuaries and reserves (e.g. Ramsar sites, Gulf of Mannar Biosphere).	Ministry of Environment and Forests (MOEF)
Environment (Central Government)	Environment Protection Act of 1986 (EPA)	Prevent coastal and marine pollution.	MOEF
Environment (Central Government)	Coastal Regulation Zone Notification of 1991 and 2011 (CRZ)	Protect the coastal zone from industrial activities up to 12 nautical miles	MOEF
Renewable Energy (Central Government)	Electricity Act, 2003	Promotion of generation of electricity from renewable sources of energy; Cross border trade of electricity to neighbouring countries	Ministry of New and Renewable Energy (MNRE); National Institute of Wind Energy (NIWE); Indian Renewable Energy Development Agency (IREDA)
Renewable Energy (State Government)	Tamil Nadu Vision 2023 (Policy Document)	Proposals for the development of offshore wind projects off the coast of Rameswaram in Palk Bay.	Department of Energy, Tamil Nadu; Tamil Nadu Energy Development Agency (TEDA)

Fisheries (Central Government)	Marine Fisheries Regulation Act 1983 (replaced Indian Fisheries Act of 1897); Marine Fisheries (Regulation and Management) Bill 2019	Registration and licensing of vessels; zonation of the sea; Regulate, restrict or prohibit: fishing in any specified area by any class of vessel, number of vessels in any specified area, use of fishing gear, or fix the hours of fishing.	Dept. of Animal Husbandry, Dairying & Fishing (DAHDF); National Fisheries Development Board (NFDB); Central Institute for Coastal Engineering and Fisheries (CICEF); Fisheries Survey of India, National Fisheries Advisory Board (NFAB); Central Marine Fisheries Institute (CMFRI); Central Institute of Fishing Technology (CIFT)
Fisheries (Central Government)	Marine Products Development Authority Act 1972	Promote seafood exports; Regulates offshore fisheries, registering vessels.	Marine Products Export Development Authority (MPEDA)
Fisheries (Central Government)	Marine Fisheries (Regulation and Management) Bill 2019	Regulation and management of fisheries in the EEZ through the Ecosystem Approach to fisheries.	DAHDF; NFDB; CICEF; FSI; NFAB CMFRI; CIFT
Fisheries (Central Government)	Maritime Zones of India Act (Regulation of Fishing by Foreign Vessels) 1981	Power to license foreign vessels in Indian waters and act against those who fish without permission.	DAHDF
Fisheries and Environment (Central Government)	The Coast Guard Act of 1978	Enforce the MZI Act and protecting the marine environment and resources.	Ministry of Defence (MOD); Coast Guard
Fisheries (State Government)	Tamil Nadu Marine Fisheries Regulation Act	Power to regulate, restrict or prohibit fishing in specifies areas to conserve fish (inc. vessel registration, licensing, fleet size). 3 nautical mile zone for small-scale/ trawl ban.	Dept. of Fisheries, Tamil Nadu
Fisheries (State Government)	Tamil Nadu Vision 2023 (Policy Document)	Palk trawlers to diversify into deep sea fishing boats over the course of five years (2017 – 2021); Priority is being given to trawlers previously apprehended by Sri Lanka; Pambam is also being developed exclusively for the deep-sea fishing vessels.	Dept. of Fisheries, Tamil Nadu
Fisheries (Local/ Palk Bay)	Local co-management policy not based on any legal instrument	Three-day-four-day rule': trawlers fish three days of the week and small-scale on the other four.	District Administration (Ramnad)

Table 5.5: Sri Lanka and the Northern Province: Legal, policy and institutional arrangements for marine governance in Palk Bay

Sector/ Government level	**Legislation/ Policy**	**Relevance to Palk Bay**	**Institution / Government stakeholder**
Foreign Affairs (Central Government)	Joint Working Group (JWG) with Sri Lanka established in 2005; Proposal for an MOU on joint cooperation on fisheries	JWG bilateral mechanism to resolve the Palk Bay conflict.	Ministry of Foreign Relations
Fisheries (Central Government)	Constitution (1987)	Fish and fisheries within territorial waters is under concurrent control of Central Government.	Ministry of Fisheries and Aquatic Resources Development (MFARD)
Fisheries and Aquaculture (Central Government)	Fisheries and Aquatic Resources Act amended (2016)	Fisheries policy, monitoring, and management; Aquaculture policy and management. Plans are currently underway to develop two new fisheries harbours at Point Pedro and Pesalai and upgrade over 20 landing facilities across the Northern Province.	MFARD; National Aquaculture Development Authority (NAQA)
Fisheries (Provincial Government)	Fisheries and Aquatic Resources Act amended (2016	Improve the livelihoods of the fishing communities in the Northern Province.	Northern Provincial Council (NPC)
Aquaculture (Central Government)	National Aquaculture Development Authority of Sri Lanka Act (No. 53 of 1998)	Manage, regulate, conserve, and develop, aquatic resources and the aquaculture industry in the Northern Province; New developments are currently underway in the Northern Province as an alternative to fishing.	NAQDA
Environment (Central Government)	The Coast Conservation (Amendment) Act, No. 49 of 2011	Development permits in the coastal zone for tourism and industrial activities; Coastal resources inventory and management plan for Palk Bay.	Coast Conservation and Coastal Resources Management Department (CCCRMD)
Environment (Central Government)	The National Environmental (Amendment) Act, No. 53 of 2000	Project approvals outside the coastal zone; Environmental Protection License process; Pollution prevention of Palk Bay and control from land- based sources in the Northern Province.	Central Environment Authority (CEA)
Environment (Central Government)	The Fauna and Flora Protection (Amendment) Act, No. 22 of 2009	Biodiversity conservation areas and protected species (e.g. in the Ramsar site).	Department of Wildlife Conservation (DWC)
Environment (Central Government)	The Marine Pollution Prevention Act, No, 35 of 2008	Pollution prevention in Palk Bay and control from marine sources at sea.	Marine Environment Protection Authority (MEPA)

The first major interaction between the two central Governments in relation to Palk Bay was the establishment of the Joint Working Group (JWG) on Fisheries in 2005. At this time, the aim was to meet on an annual basis to 'deal with issues relating to the straying fishermen, working out modalities for the prevention of use of force against them and the early release of confiscated boats, and exploring possibilities of working towards bilateral arrangements for licensed fishing in Palk Bay and the associated area of the Bay of Bengal and the Gulf of Mannar' (Manoharan and Deshpande, 2018: 83). However, the JWG has only met five times in the past 15 years (2005, 2006, 2011, 2012 and 2016) (Manoharam, 2019). As of June 2020, Tamil Nadu trawlers are continuing to cross the IMBL.

In terms of industry stakeholders, the existing body of literature on Palk Bay (Scholtens 2015; Scholtens and Bavinck, 2014; Stephen et al. 2013) is limited to descriptions and analyses of fishery stakeholders that have been actively involved in attempts to resolve the Palk Bay fisheries conflict. These include fishers' organisations such as the Boat Owner Associations in Indian and Tamil Nadu. In Sri Lanka, a number of organisations are the voice for fishery stakeholders at different scales, the local-level Fisheries Cooperative Society which is linked to the Northern Province Fisher People Alliance, and the Rural Fisheries Society under the auspices of the government-led National Fisheries Federation.

A series of fisher-to-fisher dialogues and negotiations took place from 2004 to 2014 in collaboration with NGOs and the research community in an attempt to bring about a resolution to the Palk Bay resource conflict (Scholtens, 2016a; 2015; Vivekanandan, 2011). In 2010, a collective agreement was forged that trawling would cease within one year. However, this agreement was not respected. From 2014, Governments on both sides took control of the dialogue insisting that agreements made been fishers from the two countries were not legally binding and would not be implemented (Scholtens, 2016).

Other relevant marine users dependent on effective governance of the Palk Bay marine ecosystem in both countries include the coastal tourism sector. In addition, nascent industries currently at the pre-development stage, such as aquaculture in the Northern

Province, and offshore wind energy off the coast of Rameswaram, may become significant players in the coming years.

Conflict in the region has prompted the relatively recent addition of civil society stakeholders (particularly fisheries NGOs) to the already complex socio-political environment. The Alliance for Release of Innocent Fishermen (ARIF) hosted by the South Indian Federation of Fishermen Societies (SIFFS) and the National Fisheries Solidarity Movement (NAFSO) in Sri Lanka are key NGO stakeholders. In terms of the research community, a number of fisheries research projects have been conducted in the region over the past decade.

In terms of the research community, a number of significant participatory research projects have been conducted in Palk Bay in the last decade with collaboration between government institutions, the research community and NGOs. Table 5.6 summarises the key projects, their relevance to resource conflict in Palk Bay and the participating stakeholders. FIMSUL (Vivekanandan and Kasim, 2011) and REINCORPFISH (Stephen et al., 2013) focused on the fisheries sector and most recently, Palk Bay was one of seven pilot study sites for a marine resource management project entitled, 'Conservation and Sustainable Management of Coastal and Marine Protected Areas' (Salagrama, 2014)

Table 5.6: Summary of significant participatory research projects in Palk Bay (non-exhaustive), their relevance to the resource conflict and the stakeholders representing different governance domains.

Research Project	Relevance to Palk Bay	Key Stakeholders
FIMSUL: Fisheries Management for Sustainable Livelihoods	Development of a reformed policy framework for better co-management and use of marine fisheries. Palk Bay was trialled as a study site for ecosystem-based co-management and included multi-stakeholder consultation (Tamil Nadu only).	Dept. of Fisheries, Government of Tamil Nadu; fishing community.
REINCORPFISH: Re-incorporating the excluded: Providing space for	Analysed Palk Bay fisheries governance from a social science	Research Community (University of Amsterdam;

small-scale fishers in the sustainable development of fisheries of South Africa and South Asia	and economic perspective; Applied an Action Research methodology in India and Sri Lanka and engaged with NGOs, the fishing industry and the media (Tamil Nadu and Northern Province).	University of Ruhuna; University of Jaffna; Madras Institute of Development Studies; and NGOs (Fisheries Management Resource Centre (FISHMARC); NAFSO, SIFFS, ARIF.
Conservation and Sustainable Management of Coastal and Marine Protected Areas	Aimed to improve conservation and management of Palk Bay's biodiversity through the collation of ecological data to fill research gaps and raising awareness of the importance of conserving coastal and marine areas (Tamil Nadu).	Government of India, MoEFCC, and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ-German Institute for International Cooperation); local NGOs; coastal population.

5.4 Results

This section reports the results from various data collection techniques, the Palk Bay literature review, media content analysis, semi-structured interviews with key informants, and the participatory mapping of conflict hotspots.

5.4.1 Literature review

The literature review revealed a range of themes including; the shared ethnicity of the Palk Bay fishers (Gupta & Sharma; 2008; Gupta 2009; Suryanarayan; 2005), the socio-economic implications of the civil war on Sri Lankan fisheries (Kadirgamar, 2013a; 2013b; Soosai and Stokke, 2006; Stokke et al., 2008), the limits of governability of the Palk Bay trawler fleet (Scholtens, 2015; Scholtens and Bavinck, 2012), and a critique on the porous and fluid nature of the IMBL Stephen and Menon (2016). Sathyapalan et al. (2008) present the findings of the only available survey focusing on the feasibility of a reduction in the trawler fleet. This data indicates that out of 226 trawler-owners, 23% were willing to exit the fishery, while 66%, unwilling (Sathyapalan et al., 2008:70). Vivekanandan (2011; 2010b; 2010a; 2004) review the multi-dimensionality of the conflict and the fisher-to-fisher dialogues in 2004 and 2010, while Kadirgamar and Scholtens (2015) propose recommendations for conflict resolution.

Scholtens's (2015) study is particularly relevant to this case study as he conducted a fisheries governability analysis, albeit, primarily focused from a Sri Lankan context. He argued that six factors limited the capacity for and quality of transboundary fisheries governance in Palk Bay: scalar mismatch, institutional fragmentation, politicization of processes, power imbalances, conflicting problem images and path dependency of trawling.

Table 5.7 presents a summary of the current state of the knowledge from various fields and country perspectives collated from the desk review and interviews. Whilst there are almost equal number of studies framed from both a transboundary and Indian perspective, there are considerably less from Sri Lankan sources. The results also indicate a bias towards the humanities and a shortage from the natural sciences, particularly in terms of the environmental degradation from decades of bottom trawling. In particular, the socioeconomics and legal pluralism aspects are well documented. However, there is a dearth of available environmental data from both countries relating to the fish stocks and state of the ecosystem (Salagrama, 2014).

Table 5.7: An overview of the key available (non-exhaustive) peer-reviewed research and grey literature from both sides of Palk Bay (2001-2020), collated from the desk review and expert interviews.

Field of Enquiry	Themes	References	Perspective
International Relations	Maritime relations	Manoharan & Deshpande (2018)	Transboundary
Law	IUU Fishing	Kularatne (2020); Vasan (2018); Stirrat (2018)	Sri Lankan; Transboundary; Sri Lanka
	Maritime boundary	Seth (2018); de Silva (2008; 2003)	Transboundary
	Maritime security	Wijesooriya (2017)	Sri Lankan
	Human rights	Krishnan and Pichaandy (2018)	Indian
Media	Human rights violations	Krishnan and Pichaandy (2018)	Indian
Political Geography	Territorialism	Stephen & Menon (2016)	Indian
Political Ecology	Nation-state politics	Menon et al. (2016)	Indian
	Trawler politics	Stirrat (2018)	Indian
	Tamil Nadu	Infantina et al. (2016)	Indian

Fisheries Governance	Conflict in Palk Bay	Suryanarayan (2005)	Indian
	Politics of scale	Stephen et al. (2013)	Transboundary
	Limits to governability	Scholtens (2015)	Transboundary
	Legal Pluralism	Scholtens et al., (2019) Scholtens & Bavinck (2014) Bavinck et al (2014b) Scholtens et al., 2012	Transboundary
	Participatory governance	Stephen et al., (2013a) Scholtens (2015)	Indian; Sri Lankan
	Indian trawler sector	Hettiarachchi (2007) Sathyapalan et al. (2008) Sathyapalan et al. (2011) Suryanarayan (2005)	Indian
Culture and identity	Common heritage	Suryanarayan (2005)	Transboundary
	Cross-bay migration	Gupta & Sharma (2008)	Transboundary
	Livelihood insecurity	Gupta (2009)	Indian
Socioeconomics	Trawler profitability	Infantina and Jayaraman (2020)	Indian
	Post war economies	Soosai & Stokke (2006)	Sri Lankan
	Profile of Palk Bay	Stephen et al. (2013b)	Indian
	Livelihoods	Kasim (2015); Sarvananthan (2018)	Transboundary; Sri Lankan
Civil war and Palk Bay fisheries	Fisheries re-development	Soosai & Stokke (2004)	Sri Lankan
	Effects of war	Vivekanandan (2011) Soosai & Stokke (2006)	Indian
	Effects of militarisation	Kadirgamar (2013a; 2013b)	Sri Lankan
Conflict resolution	Historical context	Vivekanandan (2001). Joseph (2003)	Indian; Sri Lankan
	Bay of Bengal Programme	Vivekanandan (2004)	Transboundary
	Good Will Missions	Kadirgamar and Scholtens (2015) Amarasinghe et al. (2016)	Transboundary
	Breaking the Deadlock	Vincent (2020)	Transboundary
Environment	Ecological condition	Sivilingham (2005)	Indian
	Coral reef monitoring	Manikandan et al. (2016) Ravindran et al. (2011) Marimuthu et al. (2016)	Indian
	Physical characteristics	Kasim (2015)	Indian

The existing body of knowledge provides insights into the diverse ways in which the underlying causes of the conflict have been framed and presented by different disciplines. However, it is clear from Table 5.9 that conflict in Palk Bay has been under-studied from an IUU perspective. Kularatne (2020) and Stirrat (2018) have recently

argued that the framing of Palk Bay fisheries (mis) management in terms of legal pluralism (i.e. multiple overlapping legal systems applying to the same situation) is misleading and represents a failure to address the main drivers of the resource conflict. Furthermore, the academic literature thus far has disregarded broader issues beyond fisheries governance including integrated approached to marine EBM.

5.4.2 Media content analysis

The Palk Bay media content analysis (described in chapter three) identified a total of 810 relevant English-language articles between 2009 to 2018. These articles were published from 18 media sources; 493 originated from India, 287 from Sri Lanka and 30 from various international sources (i.e. from Asia-Pacific region, USA, UK).

The results indicate that the end of the Sri Lankan civil war (in 2009) was a critical turning point for marine activities in Palk Bay. Sri Lankan fishers returned to fishing, increasing pressure on an already vulnerable resource. At the same time, the Sri Lankan navy turned its attention from defence to sovereignty. Consequently, arrests of Tamil Nadu fishers began to rise, as reported in the Indian media reports beginning around 2009 and subsequently in Sri Lanka media from 2010 (Figure 5.6).

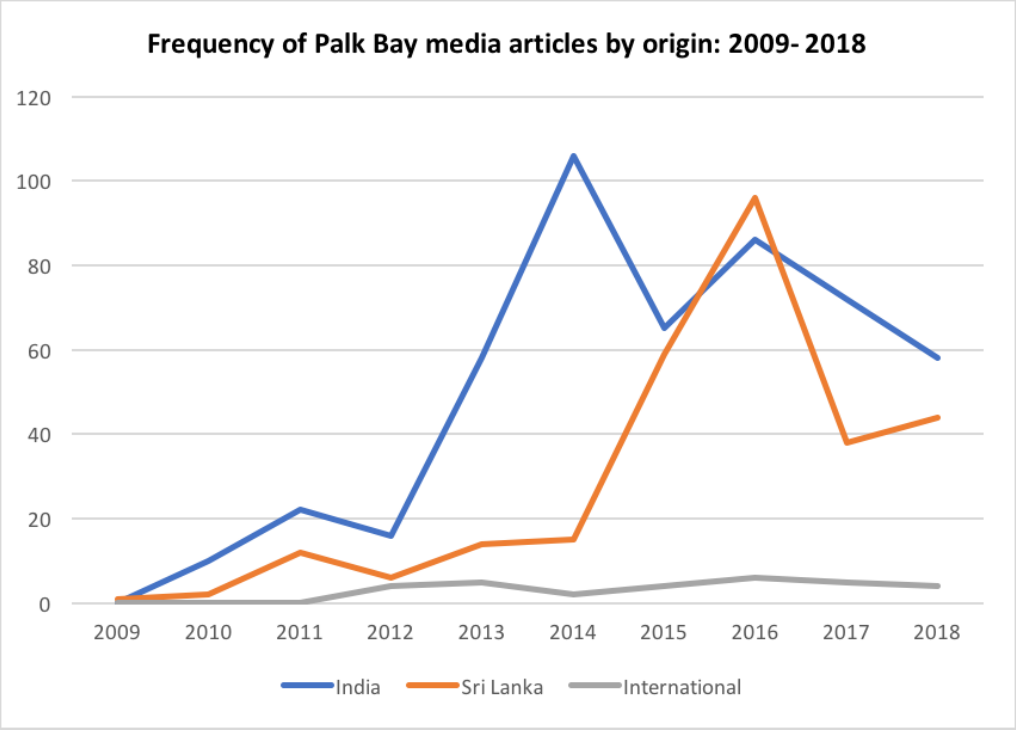


Figure 5.6: Frequency of Palk Bay media articles by Indian, Sri Lankan and international sources (2009 – 2018).

In response to Tamil Nadu intrusions across the IMBL, the Sri Lankan fishers began to take the law into their own hand. Media reports indicated that they apprehended 132 Tamil Nadu fishers and 25 trawlers at a peak in 2011. This prompted a heightened engagement of the Sri Lankan Navy. Results indicate that over 500 fishers were arrested by the Navy and imprisoned from 2011-2013 giving rise to pressure from the Indian, Tamil Nadu and international governments, as the Sri Lankan interventions were deemed to contravene international law under LOSC.

From 2012 to 2018, the number of arrests intensified. During this period, the Sri Lankan Navy detained a large number of trawlers, as a dis-incentive to fishing in Sri Lankan waters. This became a big news story in India, published articles increased from 16 to a peak of 106, while Sri Lanka saw a more modest increase of 6 to 15 articles. As Indian reports began to decline over 2014/2015, Sri Lanka media coverage surged in the corresponding period, from 15 to 96 articles. This reflected the Government's identification of the conflict as a national sovereignty issue and not just a localised Tamil issue in Jaffna.

Figure 5.8: Different reporting angles from Sri Lankan and Indian media sources.

Some similarities were observed in the types of incidents reported by the media on both sides. Similar headlines were used to describe the frequent arrests and boat detainments: '34 Indian fishermen arrested in Lankan waters' (Daily Mirror, 27/10/2015); 'Sri Lankan navy arrests 34 Indian fishermen' (The Hindu, 27/10/2015).

The differences in the key messages being communicated on opposite sides of the bay were apparent in many articles. In particular, two pertaining to the 2014-2015 fishing season in Palk Bay exemplify how one news story was presented from divergent angles (Figure 5.8). 'Fishing season ends on sore note' was the title from an Indian perspective. The Hindu (15/04/2015) reported that despite high level talks, 'the arrests continued unabated' and stated that during this season; the Sri Lankan Navy 'arrested 672 fishermen and confiscated 104 trawlers'. Across the bay the same story was headlined 'Tamil Nadu trawlers defy Sri Lankan sovereignty 36,865 times' (Daily Mirror, 19/05/2015). This article was supported by maps and satellite imagery showing over 800 trawlers operating within Sri Lankan waters three days each week (Figure 5.9).

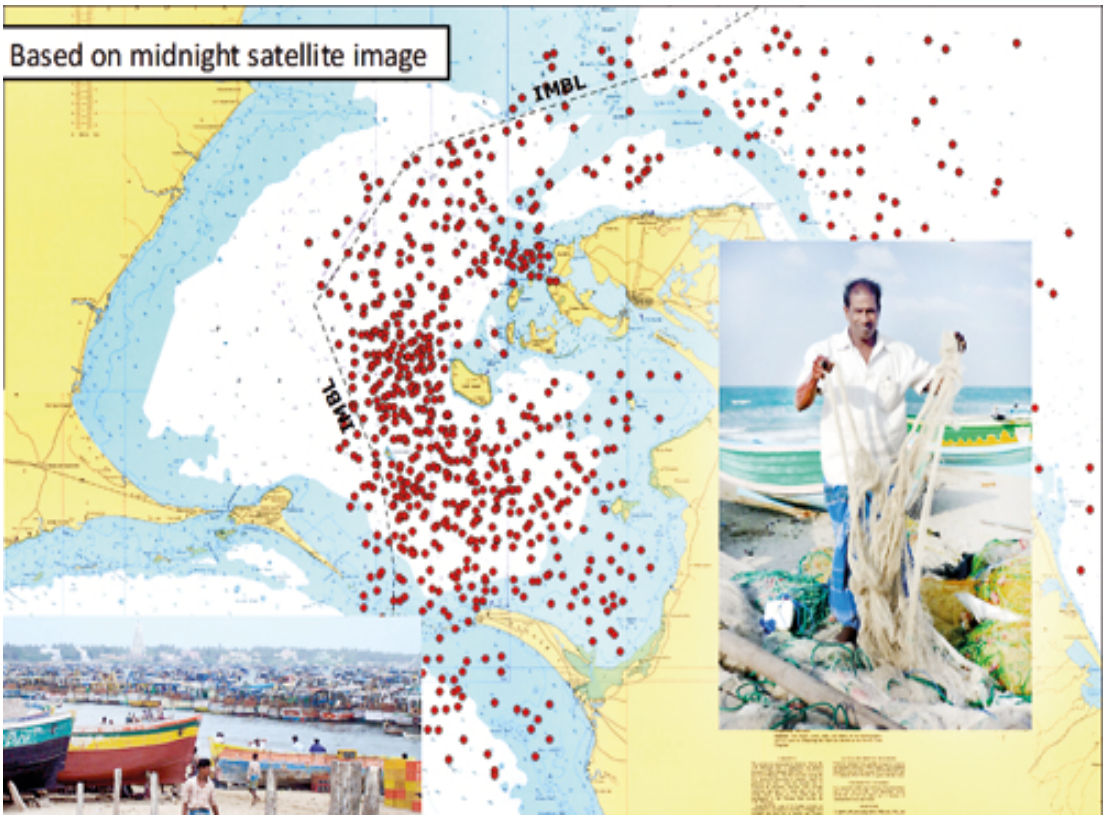


Figure 5.9 Map showing over 800 Tamil Nadu trawlers operating within Sri Lankan waters based on midnight satellite image (Source: Sunday Observer, 2016).

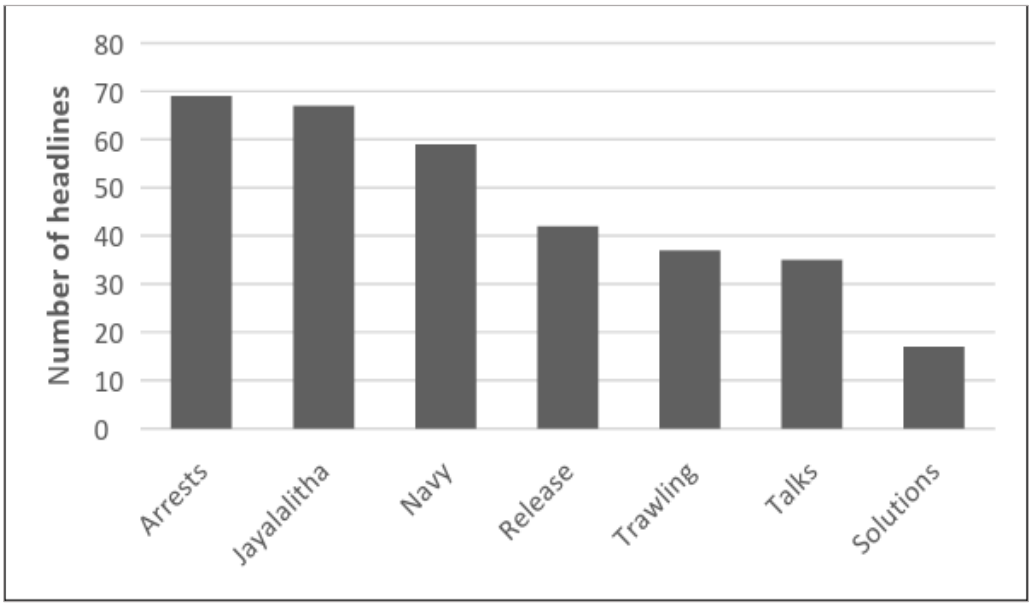


Figure 5.9: Frequently used terms and phrases in media headlines: 2009-2018. Arrests, Jayalalitha (five-time Chief Minister of Tamil Nadu from 1991 to 2016 and avid supporter of the Tamil Nadu fishers) and the Sri Lankan Navy are the most frequently occurring terms in the headlines, while talks and solutions are cited to a much lesser extent.

5.4.3 Perspectives on the resource conflict

The semi-structured interviews with the key informants focused on their perspectives on the resource conflict and the wider governance systems from the following frames of reference: looking to the past, looking to the present, and looking to the future. Four core themes emerged as critical talking points: (i) excess capacity in the Tamil Nadu trawler fleet; (ii) the effectiveness of civil-society led responses; (iii) political will to cooperate at the appropriate scales; and (iv) the contested maritime boundary.

(i) Excess capacity in the Tamil Nadu trawler fleet

From the 1960s, Palk Bay witnessed the modernisation of the fishing fleet driven by an India-wide policy that introduced mechanised boats, aimed at increasing revenue from marine resources and improving exports. The Indo-Norwegian project (1952-1972) provided the financial and technical incentives to support bottom trawling. This period of technological advancement coincided with the discovery of new markets for prawns in other continents which in turn led to a huge investment in infrastructure for the trawl sector along the Tamil Nadu coastline and especially in Palk Bay:

'Today's overcapacity on the Indian side has its roots in the '50s when the numbers of trawlers in Tamil Nadu grew hugely until around the '90s when the catch started to plummet' (P7).

All respondents believed that the trawler sector in the region has become over-capitalised and unsustainable. *'Government policies spawned a capital-intensive sector that has resulted in a battleground we see today in Palk Bay. There are simply too many trawlers operating in a very limited space'* (P2). Some stressed that it's not only a matter of over-capacity but divergence in fishing practices since the 1960s, and different perspectives on of the marine environment:

'*The environment is not a priority in India and at a national level; the trawler sector has become a runaway business. Sri Lanka has a more sustainable approach with small-scale traditional fishing practices in Palk Bay'* (P1).

'*If you extract it from the transboundary context, this is a conflict between a very large semi-industrialised fisheries fleet and a population of small-scale fishers and the conflicting interface between these two specific fishing styles. This is something you see throughout South Asia' (P7).*

Addressing the over-capacity crisis is critical to resolving the conflict. '*What we're seeing is the aftermath of the Blue Revolution where the focus was on developing this trawl fisheries. It's now run out of hand for all kinds of reasons; it's much too big and environmentally and socially destructive'* (P15). The large-scale dependency of the Indian fleet on Sri Lankan resources means that any changes are likely to be gradual and phased:

'Trawling means big money in India, there's a culture of 'fish till it's gone', fishers don't think about next month or next year. If they stop fishing in Sri Lankan waters without alternatives, the sector in and their dependents would go bankrupt over-night' (P7).

The general message was that there is an urgent need for the sector to engage with the government diversification scheme:

> *'The problem is complicated, but the solution is easy. The buy-back scheme involving 3000 of Tamil Nadu's trawlers is estimated to cost $30 million. If you compare this figure to fish exports, which provide $5 billion to the Indian economy annually, it's minimal really'* (P13).

This remedial measure is not without criticism:

> '*It's fine to say that trawling is bad or needs to stop, but it was the state that promoted this, saying it was good for the economy and good for you. Now they say they've got it wrong, so please get out. You have to offer them appropriate conditions to remove themselves from their customary fishing grounds'* (P7).

This reductionist view fails to consider the predicament of the trawler fishers:

> '*We don't have a good track record with rehabilitation policies in India. No concrete proposals have been put on the table. It's like, if someone comes to my house and says they're going to build an elevated highway through my house and by the way, are you willing to move? I'd say I'm willing to move depending on what you're offering'* (P2).

Government assumptions that the sector is open to diversifying into tuna-fishing were also disputed:

> *'Tamils from Rameswaram are not deep-sea fishers. How will they make this transition? It's a recipe for disaster unless you offer alternatives that they are happy with after some serious stakeholder engagement*' (P2).

(ii) The effectiveness of civil society led responses

The end of the ethnic war in Sri Lanka heralded a new phase in Tamil fisher relations across the bay. As fishers from the Northern Province returned to fishing in Palk Bay, tensions increased due to the scale of the trawler fleet infringing the IMBL from Tamil Nadu:

> *'The end of the war in 2009 was pivotal… even after the security restrictions at sea were lifted, small-scale Tamil fishers continued to be marginalised by the sheer scale of the trawler fleet'(P8*).

Civil society stakeholders responded on a national and transboundary scale to this escalation of events. NGOs and international researchers played an active role in efforts towards conflict resolution through the facilitation of dialogue between fishers and Governments from the late 1990s (Scholtens 2016a; Stephen, 2015). Several interviewees considered the emergence of bottom-up mechanisms between fisheries and NGOs in response to the conflict as important. In India, a number of NGOs, trade unions and fishermen's associations joined forces under ARIF to address the arrests of Indian fishers on the Indo-Sri Lankan border. In Sri Lanka, NAFSO has been helping to develop capacity to lobby the Government to defend their rights and to bring about good environmental practice in coastal areas since 1993. The ARIF- led Good Will Mission in 2004 to Sri Lanka laid the foundations for the first bottom-up dialogue between the Tamil Nadu and Sri Lankan fishers.

For some, the Fisher-to-Fisher Agreement reached in 2010 was a milestone in that Tamil Nadu fishers agreed that trawling was environmentally destructive and bottom trawling in Sri Lankan waters would stop. Others were more critical stating that the agreement:

> '*was hopelessly idealistic with no discussions of feasible alternatives to trawling. Promises couldn't be kept within one year. Meanwhile, the Sinhalese Government was suspicious of any collective action in Jaffna and not supportive of the bottom-up approaches'* (P10).

Following the 2010 Agreement, both India and Sri Lanka Government expressed a lack of respect and support for fisher-to-fisher dialogues disregarding the efforts of fishers and initiating a new top-down approach through the rural Fisherman's Federation.

Collective action across Palk Bay made a strategic decision to focus on the shared Tamil cultural heritage and marginalisation of these fishers in both India and Sri Lanka:

'*Tamil identity makes this conflict unique but more complicated. There are many fisheries conflicts between two countries but not where people from a similar socio-political identity are fishing in each other's waters.* (P1).

However, for some, the cultural links have hampered the resolution process:

'*Their commonness as marginalised ethnic groups brings them together to some extent but if the Tamilness issue didn't exist, it would be a more straight forward diplomatic dispute* (P2).

'*What was blatantly overlooked is the fact that this conflict is between Tamils who fish in Palk Bay in very different ways; one has major financial and political support propping it up, the other is small-scale subsistence fishing with no financial support and little to no political support'* (P20).

The issue of the application or '*exporting of western ideas'* (P11) to developing countries was raised by a number of experts:

'*We have to be careful that we're exporting the right types of solutions'* (P14).

Caution was expressed about assumptions that come from different socio-economic and political contexts:

'It's not fair to compare marine activities in the Tropics with elsewhere. People in this part of the world view space in a very different way' (P2).

The effectiveness of the civil society-led approaches was also called into question:

'*Bottom up approaches and theories of governance has been born in the West and are really from a northern European mind-set. It hasn't come from India or Sri Lanka. There is sometimes a mismatch when we apply these approaches in different contexts because we assume so many things like political support will exist or be similar'* (P1).

The political realities for civil society and fishers striving to interact with governments were stressed:

'*Governments do not like to be bypassed or want to devolve authority. They want to be in charge and making the big decisions in the end. Whether this is right or wrong is another matter, but this is the political reality in the bay'* (P11).

Bottom-up approaches are unable to advance to the next stage of transboundary cooperation because they don't have the authority or finances to offer feasible alternatives to offset the over-capacity in the trawler sector:

'*An NGO can't subsidise these types of buy-back or diversification initiatives, only the Government can'* (P2).

(iii) Political will to cooperate at the appropriate scales

In terms of state, national and international politics, support for a pragmatic resolution varied:

'Geopolitics cannot be overlooked; Sri Lanka are keen to keep a level of civility and reasonable relations with their bigger neighbour, they didn't want to upset India over a perceived minor issue in the fragile years following the end of war' (P10).

Political side-stepping on the Indian side was also reported:

'Different levels of Government have not been willing to take on this issue and what was wrong in the whole process was that no pressure was put on the Tamil Nadu Government by India or Sri Lanka' (P5).

The ineffective use of the (bilateral) Joint Working Group on Fisheries to bring about a collaborative strategy to end the ongoing conflict was a topical issue:

'The Group should meet annually but they've only met a few times since 2006. Delhi's response to-date has been a firefighting exercise with no strategic approach' (P1).

Political rivalry and conflicting agendas have hampered any real progress. From a Sri Lankan perspective:

'*it is not just a problem about sovereignty or governance, it is a living problem concerning livelihoods in the Northern Province and for too long it's been seen by* (the Sri Lankan) *Government as a minor issue in the bigger scale of things as it involves marginalised Tamil fishers. If it was rich Sinhalese landowners, it would be very different'* (P14).

From an Indian point of view:

'*The state is playing politics with fishermen by failing to recognise international binding agreements* (P5).

'*Actors can be in different geographical spaces but still have great significance in Palk Bay. Key players in Tamil Nadu are keeping the conflict alive; they want the issue on the boil as it serves their interests at different times'* (P15).

A clear adjustment was reported in the Sri Lankan Government's strategy towards the trawler conflict from 2014 onwards:

'*There have been distinct changes in Sri Lanka's regime. This was a game changer as trawlers were kept, not fishermen. 153 trawlers are currently in custody and this has really hurt the pockets of Tamil Nadu fishers*' (P9).

Sri Lanka's current stance is based on protecting its sovereignty and preventing illegal fishing activities in their territorial waters. On the Indian side, the Tamil Nadu Government refers to their perceived traditional fishing rights and the illegal arrest of innocent fishers. Significant progress was reported at a Sri Lankan level once the conflict was upgraded to one of national importance:

'There has been a re-framing of the issue through civil society efforts and this has brought about a different sense of ownership of the problem. The Government now see it as a national sovereignty and resource problem, instead of a Tamil problem' (P13).

The official position on the Indian side is unclear:

'*Complex politics have been played out between and within Ministries. What prevents the Government from commissioning a detailed study to plan properly for these buy-back packages? I'm just not sure what needs to happen for it be an explicit priority for the*?'(P2).

Some have been left with strong feelings of disillusionment:

'*There were lots of frustrations over the years, after much collective effort between academics, NGOS and fishers, the Government changed their minds about the importance of Palk Bay. There were many things they could do, but they didn't'* (P11).

(iv) The contested maritime boundary

The subject of the maritime boundary was a contentious issue for many of the key informants. There were diverse views on the legitimacy of the IMBL and the legality of Tamil Nadu trawlers operating in Sri Lanka's jurisdiction. From the Sri Lankan viewpoint:

'*Crossing the IMBL for the purposes of fishing is a serious infringement of sovereignty and maritime security' (P10)*.

Tamil Nadu needs to respect Sri Lanka's sovereignty and the agreed boundaries that were established in the 1970s. India couldn't do this to Pakistan, Issues relating to livelihood and historic waters don't hold' (P11).

'Sri Lanka currently has no agreements or arrangements with other states concerning fishing in their jurisdiction and no licenses for fishing operation have been issued to foreign vessels. Fishing across the border by any Indian or other foreign vessel should be treated as IUU fishing, and legal action taken against those engaged in such fishing activities' (P16).

'The EU banned all imports of Indian seafood imports in 1998 due to quality issues, if Sri Lanka really wanted to, they could shine a spotlight on India's IUU activities in Palk Bay and make thinks difficult for their biggest export market if

they were blacklisted. But geopolitics comes into play here and India could retaliate in ways that Sri Lanka just doesn't want (P17).

The longevity of the conflict has also incurred high economic and environmental costs over the last decade:

'*Monitoring the movements of the trawler fleet in these waters comes at a considerable financial cost to the* (Sri Lankan) *Government in the extra resourcing of the navy and the coastguard over many years*. From an ecological perspective, there is also '*the cost to the marine environment and over-fishing of our stocks by destructive trawl gear which is hard to quantify' (P18).*

Both the Sri Lankan Government and the fishermen from the Northern Province contend that:

'There is no foundation to the Tamil Nadu Government and trawler sector claims that they are entitled to fish across the border because they have traditional rights to do so' (P14).

'*They have deliberately disregarded the legality of the IMBL for many years now, sometimes they cite the Katchatheevu issue, saying they lost out on fishing grounds because of the IMBL agreements or they were never consulted but they fish right up to the Sri Lankan coast well beyond Katchatheevu which is just over the IMBL'* (P8).

In addition, from an IUU position:

'*Tamil Nadu trawlers are not only fishing illegally and unlicensed in our waters, they are also using fishing methods that are banned in Sri Lankan waters'.*

From a Tami Nadu fisheries and Government perspective*:*

'The response of the Sri Lankan Navy by shooting and arresting innocent fishers and confiscating the trawlers of innocent fisheries is unlawful and extreme' (P4).

This stance is not supported by the Indian Central who have repeatedly over the past decade asked that Sri Lankan's sovereignty is respected, and trawler cease their activities across the IMBL:

> '*What's most important to understand with Palk Bay is how close the coast of India is to Sri Lanka, it's a unique factor here. Generally, when you think about fishermen poaching in other countries, it happens far out at sea*' (P19).

For the Tamil Nadu fishermen, '*maritime boundaries are imaginary lines in the sea*' (P17) and when the:

> '*stocks collapsed on the Indian side of the bay, they began fishing further into their neighbours' waters where there is plenty of fish, they're hunters, they go where the fish are regardless of borders and in this way, all these claims of historical rights are just nonsense and a smokescreen to the bigger picture*' (P9).

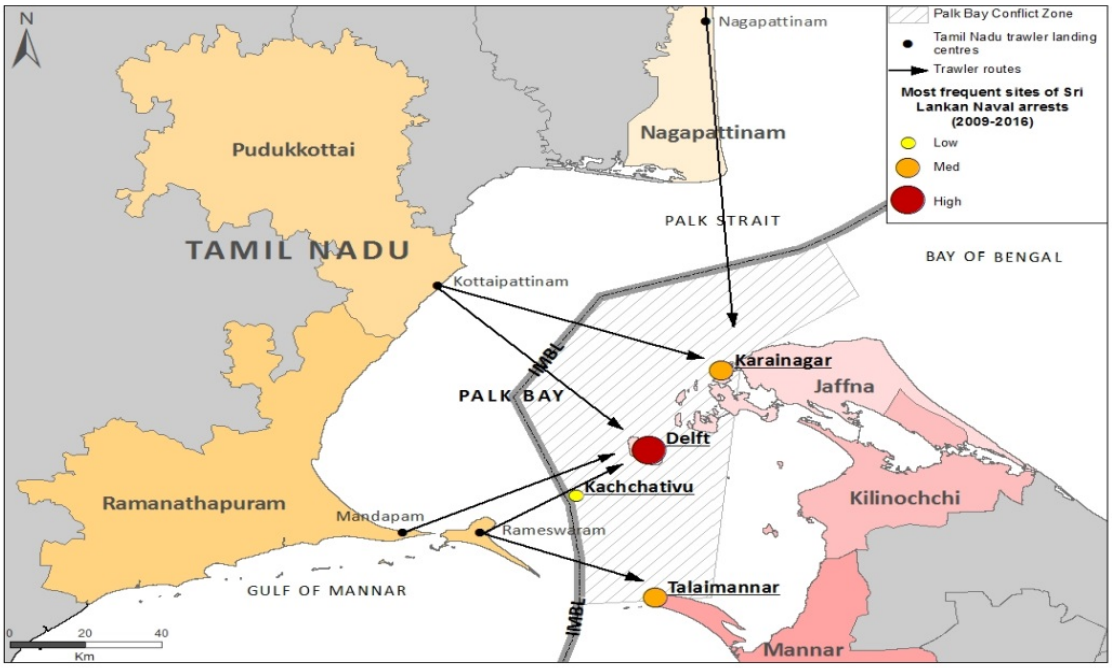


Figure 5.10: Palk Bay conflict hotspots identified through semi-structured interviews and media analysis based on the prevalence of large quantities of trawlers or reported arrests by the Sri Lankan Navy. The arrows indicate the trawlers routes from the Tami Nadu harbours of Nagapattinam, Kottaipattinam, Mandapam and Rameswaram to fishing grounds in Sri Lankan waters. Delft was the most frequently reported location for detentions of trawlers, followed by Talaimannar, Karainagar and Kachchativu (Source: The author).

5.5 Palk Bay Trajectory of Change Timeline

A synthesis of the data collated from the desktop research, the semi-structured interviews and media analysis is presented in Figure 5.11 as a Trajectory of Change Timeline. The framing of the conflict arising from the analysis gives rise to four seminal eras of change in the region:

1. Indo-Lankan geopolitical revisions (1947-1976).
2. The Blue Revolution (1960-1990),
3. War and peace in Sri Lanka (1983-2009),
4. Conflict escalation in Palk Bay (2009-2018).

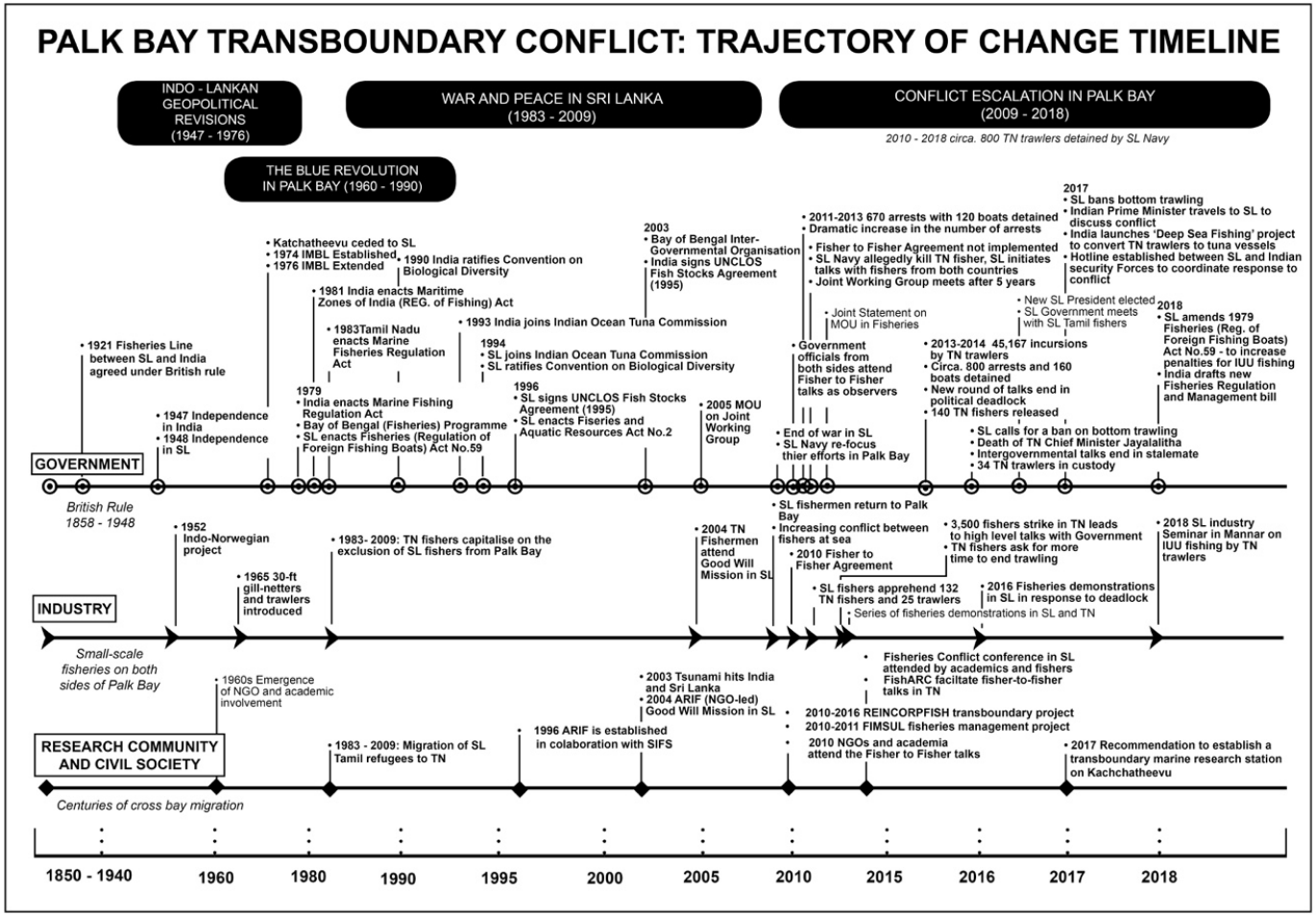


Figure 5.11: Palk Bay Trajectory of Change Timeline: Unpacking complexity and tracing parallel changes in the governance responses from 1850- 2018. Based on data collated from desk review, media analysis and expert interviews.

5.6 Discussion

Based on the primary and secondary data presented in preceding sections, this section critically analyses the interplay between the existing governance arrangements, historical legacy, geopolitical transformations and the current resource conflict. It begins with a discussion of the limits to the governability of the Palk Bay ecosystem and an evaluation of the current governance system against Ostrom's (1990) principles for successful governance of common pool resources. This is followed by an analysis of the evolution of the resource conflict, an assessment of its escalation (Yasmi et al.'s 2006) and its links to the wider historical legacy and geopolitical context.

5.6.1 A small bay with big management problems: Limits to the governability of the Palk Bay ecosystem

According to Chuenpagdee and Jentoft (2009), assessing governability (particularly in a contested marine ecosystem) is part of a reality check that governors must engage in prior to develop pragmatic interventions to improve effectiveness or tackle resource conflicts. Governability challenges are entrenched in the interactions between the system-to-be-governed (section 5.2) and its governing system (section 5.3) (Chuenpagdee and Jentoft 2013).

The findings from the case study demonstrate that Palk Bay has a fragmented governance framework with a multitude of legislation (Table 5.3) and institutions (e.g. environment, fisheries, tourism, energy) relevant to the marine ecosystem operating at sub-national, national, regional and international scales (Tables 5.4 and 5.5). In terms of institutional fit, Palk Bay does not have a corresponding organisational structure at the appropriate geographic or ecosystem scale. India has 10 central Government institutions (i.e. Ministries, Departments, Authorities and Agencies) and an additional five at a state level with a marine function. Similarly, Sri Lanka has 12 central Government institutions and four at a Provincial level.

The wider context has constrained the effectiveness of governance responses in the transboundary marine ecosystem and any future long-term resolution will be contingent on decisions made far from the fishing grounds and beyond the immediate influence of fishers and civil society.

Table 5.8 provides an evaluation of the current governance system in Palk Bay against Ostrom's (1990) eight principles for successful governance of common pool resources. The premise of this evaluation was that each principle can provide insight into areas for improvement in the existing governance regime or next steps for more effective governance in the long-term. Similar to the Lough Foyle case study, the results of the evaluation indicate that a number of the principles for common pool resource governance are incompatible with Palk Bay's contextual complexities.

Based on evidence from the case study, its usefulness for assessing contested marine ecosystems is debatable and it may be better suited to non-contested ecosystems. For example, the first principle states that *the physical boundary of the natural resources along with a list of eligible and authorised users should be clearly defined.* From a legal perspective, Palk Bay has clearly defined boundaries but there are ambiguities surrounding the interpretation of the 1974 IMBL. Article 6 grants free movement of vessels throughout Palk Bay as before (i.e. for Indian and Sri Lankan vessels). Tamil Nadu interpret this clause as including fishing rights; however, Sri Lanka refute this claim. Ostrom's principle for clearly defined boundaries does not consider this type or uncertainty.

The fourth principle states *monitoring, and evaluation is vital to deter potential non-compliance by defaulters*. There is little evidence of monitoring and evaluation of the marine environment and its resources which is not unusual for many countries in the Global South. IUU fishing activities by the Tamil Nadu trawlers are monitored by the Sri Lankan Navy (but not by the Indian authorities). Despite consistent and regular surveillance by the Sri Lankan authorities, the fisheries conflict has not abated at any time in recent perhaps due to the scale of the trawler fleet.

The sixth principles states that *mechanisms must exist in order that conflicts can be resolved quickly, cheaply and fairly.* The basis for this principle is when conflict resolution mechanisms are not available or easily accessible, successful common pool resource governance will be more difficult. The JWG that was established as a mechanism to resolve the conflict has been ineffective in doing so. In addition, Evidence from this case study indicates that the current scenario in Palk Bay is fuelled by a range of contextual factors include wider domestic politics and over-capacity of the state-funded trawler sector which cannot be resolved quickly, cheaply or fairly.

The seventh principle states that *natural resource users must be given some degree of freedom and flexibility to organise themselves to enhance relevance, applicability of rules and norms.* The Fisher-to-Fisher Agreement in 2010 was a bottom-up attempt for fisheries co-management in Palk Bay on a transboundary scale through collective action by fisheries association on both sides. However, central Governments from both countries were not supportive of these efforts and since then, the discussions have only been conducted at a bilateral level through the JWG.

Table 5.8 Evaluation of Palk Bay governance system with Ostrom's (1990) principles for successful governance of common pool resources.

Ostrom's (1990) principles	**Description**	**Palk Bay Assessment**
1: Clearly defined boundaries	The physical boundary of the natural resources along with a list of eligible and authorised users should be clearly defined.	IMBL is formally agreed between India and Sri Lanka but contested by the state of Tamil Nadu. Fishermen are authorised to fish in their respective waters only and are not licensed to fish across the IMBL.
2: Congruence between the environment and the governance structures	Those who derive benefits from use of natural resources should concomitantly contribute towards provisioning and maintenance activities. Such interventions should be tailored to local conditions to ensure long-term sustainability.	Palk Bay has a fragmented governance framework with a multitude of legislation and institutions (e.g. environment, fisheries, tourism, energy) relevant to the marine ecosystem operating at sub-national, national, regional and international scales.
3: Collective-choice arrangements	Stakeholders that depend on the natural resource should actively participate in decision-making processes.	There are limited opportunities for non-state stakeholders (i.e. industry, research community, NGOs and civil society) to participate in decision-making processes.

4: Monitoring and evaluation	Monitoring and evaluation is vital to deter potential non-compliance by defaulters.	There is little evidence of monitoring and evaluation of the marine environment and its resources. IUU fishing activities are monitored by the Sri Lankan Navy.
5: Graduated sanctions	All defaulters must be penalised for non-compliance and penalty increased according to the severity of the offence.	Those found to be engaged in IUU activities are penalised in different ways ranging from verbal warning to arrests, boat detentions and shootings. There seems to be no consistency in the enforcement strategies.
6: Conflict resolution mechanisms	Mechanisms must exist in order that conflicts can be resolved quickly, cheaply and fairly.	The JWG was established as a bilateral conflict resolution mechanism. Between 2005 and 2016, there have been five meetings and little progress has been made.
7: Minimal recognition of rights to organise	Natural resource users must be given some degree of freedom and flexibility to organise themselves to enhance relevance, applicability of rules and norms	The Fisher-to-Fisher Agreement in 2010 was an attempt to co-manage Palk Bay on a transboundary scale through collective action by fisheries association on both sides. Central Governments from both countries were not supportive of these efforts.
8: Multi-layered nested framework	For larger resource systems, rules are embedded and enforced within a multi-layered nested framework for easy coordination, networking and being responsive to specific situations	A multi-layered framework currently exists but it lacks coordination and collaboration at the scale of the ecosystem

5.6.2 Evolution of the resource conflict and its links to the wider historical legacy and geopolitical context

Formal maritime boundaries have been agreed between India and Sri Lanka since the 1970s. However, it would seem that in the case of Palk Bay, fishermen from Tamil Nadu have not respected these geopolitical revisions at sea. The current impasse in Palk Bay revolves around polarised perspectives relating to the geopolitics of maritime territory and access to resources which have been exacerbated by broader Sri Lankan and Indian national political interests. There has been a lack of intervention at an Indian level combined with intense political resistance from Tamil Nadu to address the overcapacity in the trawler sector. Palk Bay is symptomatic of Tamil Nadu's complex hard-line stance with Delhi in terms of wider Tamil politics and the historic animosity between India, north and south. Resistance and (non-) cooperation can influence the spectrum of potential solutions to complex conflict.

Conflict resolution must be approached with an awareness of the description within which the conflict is embedded (Kriesberg, 2001). Applying a process of multi-perspective framing has allowed for a holistic understanding of the case study context. Looking to the past to establish the unique context within which the conflict has unfolded is integral to understanding the current state of affairs in Palk Bay. Development of the Trajectory of Change Timeline (Figure 5.11) facilitated the systematic analysis of the linkages between external geopolitical transformations, the multi-scalar governance interactions and the limited progress made to-date towards a genuine resolution. It synthesises intricate connections between different expressions of power and influence and emphasises how both countries are historically linked across all four eras. The establishment of the IMBL, the Blue Revolution, the end of the war in Sri Lanka, naval intervention and regime changes are major flashpoints.

When evaluated against Yasmi et al.'s (2006) continuum of conflict escalation in natural resource management, Palk Bay has progressed through all stages from one to eight. Since the end of the civil war, it has escalated from verbal clashes at sea (stage two), to lobbying Governments and public protests on both sides of Palk Bay (stage three and four), vast numbers of arrests, injury and loss of life through shootings (stages six and seven). From 2013 onwards, the conflict has been characterised by intense national and international media attention and despite a series of bilateral negotiations through the JWG (stage 8), as of 2020, the conflict continues.

GIS mapping (Figure 5.10) provided clarity in terms of the present-day spatial dimension of the Palk Bay conflict and the limited geography to reconcile competition for space between users. The proximity of the fishing grounds, with an IMBL separating a limited, semi-enclosed marine space by only 30km (as illustrated in Figure 5.3) has meant that the Tamil Nadu fishers, in a sense have become *prisoners of geography* (Marshall, 2015). This has been compounded by their desire to retain the status quo and resist changes such as not fishing across the IMBL or diversifying into alternative fishing practices in the Bay of Bengal.

5.7 Re-framing the conflict

Following Hisschemöller and Hoppe (2001; 1995), Palk Bay can be classed as an 'untamed political problem' with the enforcement of technical solutions being met by intense political and societal opposition from both countries. The IUU dimension of the resource conflict exacerbates the gravity of the political problem and could potentially result in sanctions from the EU which is a major seafood export market for India. Future long-term solutions lie within the influence and power of the Tamil Nadu and Indian Government, respectively and are dependent on addressing over-capacity in the trawler sector. Sri Lanka has availed of its only pragmatic technical measure, combatting illegal fishing through arrests and boat detainments. On the Indian side, an agreement to cease trawling in Sri Lanka and implement a buy-back and diversification compensation scheme has yet to materialise. While it is recognised that achieving high-level political agreement seems elusive, unless the current crisis is prioritised by politicians, conflict and its many consequences are likely to persist in the region.

5.8 Future governance options

The following evidence-based insights for future governance options are sensitive to the wider historical context and align with current geopolitical realities across Palk Bay and South Asia.

1. *Collecting scientific data through national and transboundary initiatives*

At an institutional level, a significant barrier has been a lack of human and financial resources to enforce the relevant regulations or manage their marine waters. A critical absence of data relating to stock assessments and the status of the Palk Bay ecosystem in both countries was validated by the desk study and interviews. Results indicate a distinct bias towards the humanities and a shortage from the natural sciences (Table 5.7). In particular, the socioeconomics and the political ecology aspects of the conflict are well documented. A previous attempt to address this ecological gap through transboundary scientific collaboration failed to garner support or a willingness to cooperate across the border. Although, this unwillingness

to cooperate may be due to capacity issues, it is symptomatic of wider problems influencing the conflict.

Tamil fleets across the spectrum, from artisanal to semi-industrialised are faced with increasing socio-cultural challenges by over-exploitation of the fisheries resources in Palk Bay, yet there is a critical lack of scientific data on which to develop sustainable management strategies. Enabling the collection of data on which to support rational exploitation and management is a prerequisite to enable a future for the Tamil fishing fleets. Reducing the scientific uncertainty will require funded mechanisms for capacity building and should be informed by the lessons learned from previous similar initiatives.

Whilst the author recognises that Palk Bay requires a socio-ecological system-based multi-issue approach which recognises the value of effective stakeholder participation, issues and responses need to be isolated and simplified to arrive at a logical starting point. An ecological joint fact-finding programme could be a catalyst to address the environmental uncertainties through data collation and sharing at both national and transboundary scales. Such a development would also fulfil LOSC obligations to cooperate and coordinate activities relating to managing living resources and environmental and research policies in semi-enclosed seas. A radical shift in the current mind-set of scientists backed up with political support across the IMBL could facilitate more advanced thinking in the region in terms of robust evidence-based policies and decision-making processes.

2. *Engaging all relevant stakeholders through a transboundary integrated marine governance regime.*

Achieving good governance of transboundary marine resources requires effective multi-scalar governance with appropriate stakeholder mechanisms at the local, national and international levels (Armitage et al., 2009; Newig and Fritsch, 2009); Cash et al., 2006). This paper substantiates previous Palk Bay research (Scholtens, 2015; 2016a) that a key constraint to resolving the conflict has been the scale

mismatch between the current governance arrangements and the transboundary ecosystem.

'People are part of the system within which the problem occurs' and 'are themselves involved, affected and responsible' (Jentoft and Chuenpagdee, 2009: 556). Findings indicate that the human barriers could be overcome through the long-term incremental development of a transboundary integrated marine governance regime. The over-arching goals would be to prevent and resolve conflict arising from environmental degradation and to promote sustainable coastal and maritime development on a transboundary scale. This long-term, strategic approach would be contingent on full political buy-in at all levels in combination with pro-active engagement with industry and civil society stakeholders. In terms of good environmental governance, this framework should incorporate the skills and experience of the fishers, the professional expertise of NGOs (e.g. human rights and environmental), the capacity and technical skills of the scientific community (research institutions), the role of church leaders as gate keepers and the tacit knowledge of coastal communities from India and Sri Lanka.

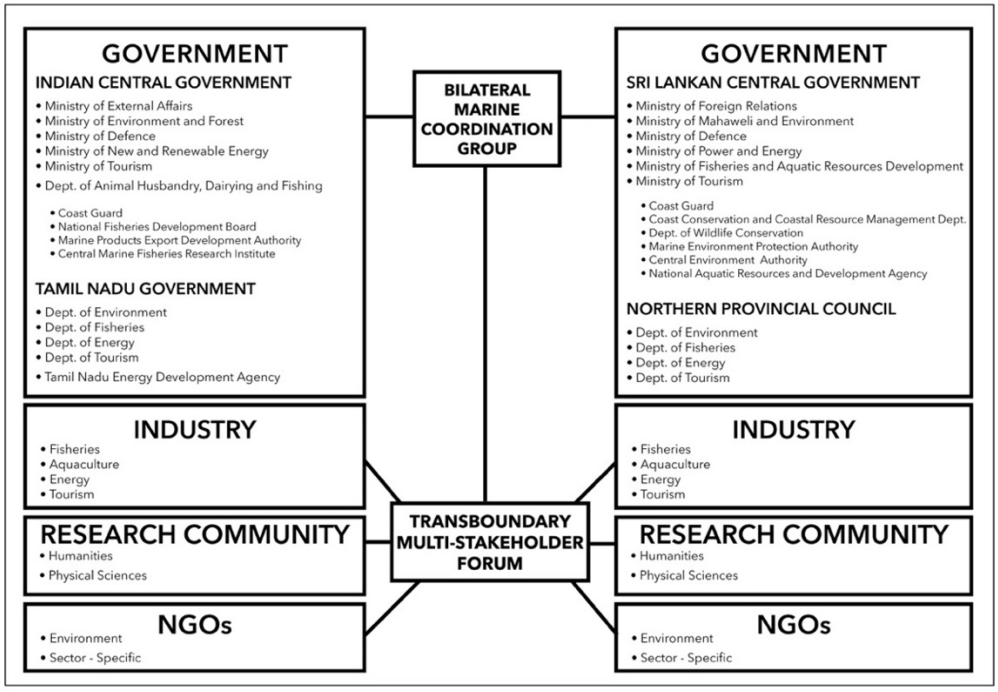


Figure 5.11: A proposed Transboundary Integrated Marine Governance (TIMG) framework for Palk Bay.

Building on the Transboundary Integrated Marine Governance (TIMG) framework presented in Figure 5.11, this governance mechanism could fulfil the aim of the proposed joint ecological programme in addition to bringing all stakeholders together on a regular and issue-specific basis. Considering the limited effectiveness of recent bottom-up governance approaches, the Bilateral Marine Coordination Group denotes a new top-down stakeholder mechanism to address the environment uncertainties incorporating inputs from representatives from all relevant Government institutions with a marine remit (e.g. Ministries, Departments, agencies and Government- led research institutes). This would be supplemented by a Transboundary Multi-Stakeholder Forum consisting of relevant non-state stakeholders representing different sectors of industry (e.g. fisheries, aquaculture, tourism, energy), the research community and NGOs. This new transboundary mechanism would:

- Bring about a more integrated approach to marine governance at an ecosystem level building on existing sub-national and national structures in both countries.
- Extend the focus of the dialogue beyond fisheries to incorporate other marine uses and future alternatives; and
- Adopt a more holistic, forwarding-thinking approach that considers all components of the complex Palk Bay socio-political ecosystem.

3. *Developing alternatives to fishing in the developing sectors of aquaculture, tourism and offshore energy*

Asymmetry and inequality significantly influence their prevailing geopolitical power relationships. India is the seventh largest country, the sixth largest economy globally and a regional super-power within South Asia. Sri Lanka is a small island nation emerging from an intense 30-year ethnic civil war. This disparity is amplified at a Palk Bay scale as evidenced by the contrast in fishing capacity across the bay in Table 1. The rapid development of the Tamil Nadu trawler sector during the era of the Blue Revolution has resulted in excess fleet capacity levels (Table 5.3).

Previous research (Scholtens 2015; Scholtens 2016a; Jentoft and Chuenpagdee; 2015) has presented the conflict in Palk Bay as essentially wicked (Rittel and Webber, 1973) and resistant to management solutions. They call for a paradigm shift from fisheries management to fisheries governance. Wicked problems have no clear stopping point (i.e. resolution) or set of well-described potential solutions (Jentoft and Chuenpagdee, 2009). The path dependency of the trawlers (e.g. boat owners have outstanding loans; government diesel incentives) as a result of the Blue Revolution of trawlers has a strong degree of irreversibility that contributes to the problem's wickedness (Scholtens, 2015; 2016a).

The trawler sector's refusal to change their behaviour as evidenced by the persistent incursions (i.e. 3,200 fishers reported arrests from 2009- 2016) and their current reluctance to cooperate with the Government's diversification schemes is problematic. Decommissioning of the trawler fleet and its inherent re-allocation of shared resources represents a major threat to both the sector and a population of over 307,000 Tamil Nadu- based fisher folk. Group inertia will need to be transformed into cooperation in order to advance the scheme's buy-back plans and can only be overcome through technical measures that promote pragmatic livelihood alternatives. More equity in terms of the scale of their respective motorised and traditional fishing fleets in India and Palk Bay would support a return to a common agenda which is integral for the effective governance of the shared ecosystem.

Different employment opportunities such as aquaculture, tourism and offshore energy could be explored through extensive engagement with relevant stakeholders across Palk Bay and beyond through the TIMG framework. International assistance could be requested from Norway linked to the original Indo-Norwegian Agreement from the 1950s. For example, India and Norway have recently embarked on a joint research project to achieve bilateral results in the field of aquaculture and biotech (Department of Science & Technology, India and Research Council of Norway, 2017). Palk Bay could be used as a test site for this or similar projects to explore feasible long-term alternatives to fishing.

4. *Achieving high-level political agreement within the constraints of geopolitics*

There has been a lack of consistency in political support at local, national and international scales. No strategic action has emerged despite a series of high-level diplomatic meetings throughout the latter part of the Conflict Escalation era. A failure to respect the IMBL agreement and to coordinate activities to manage and conserve the shared marine ecosystem has prolonged the conflict.

Political will at the highest level is fundamental to achieving any form of agreement and thus far has been unattainable. When evaluated against existing cooperation models (Waisová , 2013; Sandwith et al., 2001; Zbicz, 1999a; 1999b), empirical findings from Palk Bay, include: encouraging the conflict for political interests (Tamil Nadu Government); strategic political resistance and non-cooperation or at different times (e.g. Indian Government, Sri Lanka Government; Tamil Nadu Government; Northern Provincial Council; Tamil National Alliance); cooperative attempts for conflict resolution (e.g. civil-society led fisher-to-fisher negotiations; high level diplomatic bilateral talks; Joint Working Group).

This research reveals that Governments from this part of South Asia are less supportive of bottom-up approaches (at national and transboundary scales) and favoured a more top-down strategy to interventions in Palk Bay. The timing of various bottom-up governance responses, particularly just after the end of the war, proved to be incongruent with the prevailing political climate. The Sri Lankan Government had different priorities in the context of post-civil war efforts during the Conflict Escalation era, with the Northern Province experiencing gradual demilitarisation from 2010 to 2016. Initial steps towards collective action by civil society to address the Palk Bay conflict were perceived by the central Government as a potential threat to national peace and security.

5.9 Conclusion

This case study explored a complex resource conflict at sea involving a shared but contested ecosystem separated by a formally agreed International Maritime

Boundary Line (IMBL). Most peer-reviewed literature from Palk Bay thus far has been limited to discipline specific studies such as social and economic analyses relating to fisheries governance (e.g. legal pluralism; mechanisation of the fishing industry) or most recently, political and legal analyses (refer to Table 5.7 for a summary of the state of the knowledge). For the most part, the existing body of literature has overlooked other critical components which are explored in this chapter. Firstly, the IUU context of the conflict has only recently began to receive attention[31] (Kularatne, 2020; Stirrat, 2018; Vasan, 2018), this case study contributes further insights from this perspective. Secondly, the potential for more integrated, inter-disciplinary marine governance regimes (that move beyond single sector approaches) through the application of geopolitically context- specific ecosystem-based management (EBM) has not been explored to-date in the Palk Bay context.

Palk Bay is a highly productive marine ecosystem that supports the socio-economic needs of a large coastal population. However, the transboundary resource is increasingly at risk due to changing parameters such as environmental (e.g. ecological degradation, declining fish stocks) socio-political (e.g. shifting political will, dilution of Tamilness identity, perceived injustice on both sides) and economic instability (e.g. over-reliance on fisheries, uncertainties with the buy-back scheme). The multi-faceted case of Palk Bay represents a microcosm of contemporary environmental governance problems underpinned by regime changes and geopolitical instability operating at a much higher scale which therefore increase the challenges to make progress at a transboundary level.

A systemic appreciation that respects historical and geopolitical context is essential to reconcile natural and anthropogenic interactions with multi-scalar governance processes in transboundary contexts. Pragmatic solutions to strategically plan for the existing and future demands on the shared resource can only be found following a transition from political resistance to functioning intergovernmental cooperation. Ultimately, this will require a radical transformation by both governments to build

[31] These articles were published in 2018 and 2020 (three to five years) after the fieldwork in 2015 and the bulk of the interviews were conducted for this study.

capacity and implement governance structures at the appropriate scales that are sensitive to the diverse needs and values of all relevant stakeholders.

Chapter 6: Comparative case study analysis and the overall findings

6.1 Introduction

This chapter addresses the third research objective: *identify key issues from current practices via insights from the case study analysis to understand the complexity and uncertainties around geopolitical realities affecting marine governance in these contexts.* It is divided into two parts. Although the dynamics of the resource conflicts and their historical precedents differ, the results of the case studies from peripheral geographies are compared based on the analytical criteria presented in the conceptual framework (i.e. multi-perspective analytical framework the Figure 2.7). This includes an assessment of the analysis outcomes from the three pillars (i.e. governability assessments, resource conflict analyses and the geopolitical analyses of the maritime border disputes). The second part of this chapter presents six core findings derived from a synthesis of the results of the inter-disciplinary review, the case studies and the comparative case study analysis within the context of the theoretical pillars examined in this thesis:

Geopolitics and Maritime Boundaries

i. The footprint of the past: the legacy of colonialism and arbitrarily drawn boundaries;
ii. Coastal border regions: the paradox of spatial proximity to neighbouring states and peripherality from the seats of political power;

Environmental Governance

iii. Strategy or apathy: the consequences of political inaction;
iv. Contested marine ecosystems and the limitations of LOSC and existing theories of environmental governance;
v. The challenges of moving away from traditional approaches based on political boundaries towards integrated ecosystem-based governance;

Conflict Analysis and Resolution

vi. Incorporating multiple-perspectives to develop frame-breaking insights and solutions for resource conflicts in contested marine ecosystems.

These core findings are discussed in relation to the existing bodies of literature reviewed in chapter two, the research methodology and the research questions designed for this study.

6.2 Comparative analysis of Lough Foyle and Palk Bay

In seeking innovative solutions to address the human barriers to effective transboundary marine governance in contested marine ecosystems, a multi-perspective interdisciplinary framework was designed and applied in two contrasting cases studies from the Global North and Global South. In spite of some clear differences, chapters three and four demonstrate that these study sites are comparable on a range of issues and can be analysed by the same contextual variables (i.e. historical legacy and geopolitical realities influencing the ownership or boundary dispute; marine biogeography and biodiversity; socio-economic profile; existing governance system; and evolution of the resource conflict). This section compares the findings of the case studies of Lough Foyle and Palk Bay in terms of the analytical outcomes from the three pillars.

6.2.1 The outcomes of the governability assessments

Following Chuenpagdee and Jentoft (2009), assessing governability (particularly in a contested marine ecosystem) is part of a reality check that governors must engage in prior to develop pragmatic interventions to improve effectiveness or tackle resource conflicts. The assessments conducted on the interactions and linkages between the socio-ecological systems (with some additional contextual variables included e.g. historical and geopolitical legacy; and the existing governance systems in both regions confirmed that there are limits to the governability of the Lough Foyle and Palk Bay ecosystems. High levels of legal (Tables 4.1 and 5.3) and institutional fragmentation by sectoral functions (Figures 4.9; Tables 5.4 and Table 5.5) and a complex network of diverse state (Figures 4.9 and 5.13; Table 5.3) and non-state stakeholders (Figures 4.11 and 5.13) from two jurisdictions at different scales ranging from local, state, regional, national and transboundary were a feature in both case studies.

The Lough Foyle governance system encompasses 20 government institutions with a marine function at local, regional (sub-national/ devolved administration) and national levels and an additional four transboundary institutions (Figure 4.9). The remit of the transboundary institutions range from the loughs, to all-island and bilateral. In comparison, Palk Bay is less developed than that of Lough Foyle and even more fragmented. The Palk Bay governance systems consists of 31 government institutions with a marine function at local, state and national levels and one transboundary mechanism (the JWG). India (and Tamil Nadu) has 15 (Table 5.4), and Sri Lanka (and the Northern Province), 16 (Table 5.5).

In an effort to address the fisheries conflict in Palk Bay at a transboundary scale, the JWG on fisheries was established in 2005 with the aim of meeting on a regular basis. The JWG is the only official transboundary governance mechanism that currently exists unlike the various transboundary institutions on the island of Ireland. Its sphere of activity is limited to bilateral discussions specific to incursions by Tamil Nadu fishermen including the penalties imposed if captured by the Sri Lankan navy. In terms of institutional fit (Chuenpagdee and Jentoft, 2009), Palk Bay does not currently have a corresponding organisational structure at the appropriate geography or ecosystem scale. The Transboundary Integrated Marine Governance framework presented in Figure 5.13 is a conceptual model that could potentially bring about a more integrated approach to the region by building on its existing sub-national and national structures in both countries. This approach could extend the focus of the dialogue and planning beyond fisheries to incorporate alternative marine uses by adopting a more holistic and forward-thinking strategy (i.e. MEBM) that considers all components of the complex Palk Bay socio-political ecosystem.

From the perspective of transboundary governance arrangements in Lough Foyle, at the time of writing (June 2020), there is a high level of convergence in marine and environmental legislation due to the harmonisation effect of 47 years of EU membership (e.g. through the transposition of nice EU Directives into national law- in both jurisdictions, Table 4.1). However, real uncertainties prevail in terms of the

extent to which legislation may diverge from 2021 onwards when the UK is no longer an EU Member State.

The Loughs Agency was established following the end of the Troubles as one of a number of all-island governance institutions to foster sectoral cooperation. Findings from the case study have shown that the Loughs Agency remit is limited to specific sectors and transboundary resources (i.e. inland fishing, marine-tourism and in theory, aquaculture). Whilst this model is a step in the right direction in terms of integrated transboundary marine governance, the Loughs Agency remit does not include a number of other sectors, activities and stakeholders (e.g. sea fisheries; fishing ports; cross-lough ferry; Foyle Port; City of Derry airport etc.) that utilise the Lough (Figure 4.11). In addition, their current powers to regulate the aquaculture sector in Lough Foyle are impeded by the political impasse related to long-standing ownership dispute. Inadequacies were also identified in relation to the effectiveness and exclusiveness of their Advisory Forum for stakeholders.

Given the complexities and limitations identified in the governance systems in both case studies, it is unsurprising that the responsiveness of the various institutions with different remits has thus far failed to address the respective resource conflicts. Political inaction and an unwillingness to compromise by both state and non-state actors have featured in all four jurisdictions. Due to the geopolitical sensitivities associated with territory and sovereignty, this study has highlighted that stakeholders at the local study-site level or even the existing transboundary institutions (i.e. Loughs Agency) or mechanism (JWG) do not have the power to adequately address these conflicts. Any future long-term resolution will be contingent on decisions made far from the shores of Lough Foyle or Palk Bay, most likely by diplomats beyond the remit of marine or environmental affairs.

6.2.2 The outcomes of the geopolitical analyses of the ownership and maritime boundary disputes

No discussion relating to geopolitics is complete without emphasising the geographical context. In terms of locations and the types of marine ecosystems, the

disparity between the case studies from the Global North and Global South are stark. Located in the peripheral Atlantic region of north-west Europe, the disputed border bay of Lough Foyle separates the two sovereign jurisdictions. Northern Ireland is the only part of the UK to share a land border with another EU Member State. In recent decades, the region has commonly been referred to in terms of 'all Ireland' and 'all island' emphasising the shared geography of the ROI and Northern Ireland (Murray, 2004). In contrast, located in South Asia, in the north-eastern part of the Indian Ocean, Palk Bay is a semi-enclosed shallow sea separating India and Sri Lanka. Asymmetry is evident in both case studies due primarily to the vast differences in the country sizes and associated populations (e.g. 5.9 million in Ireland compared to 66.6 million in the UK; 1.3 billion in India compared to 21.6 million in Sri Lanka). The larger country and economy will invariably be more powerful in geopolitical relations (Cohen, 2014).

The current status of the IMBL and ownership varies in the case studies and surrounding debates have intrinsically been linked to the ebb and flow of the geopolitical climate over the last century. In both regions, major geopolitical flashpoints influencing the status quo in both Lough Foyle and Palk Bay were identified through the Trajectory of Change Timelines (Figures 4.18 and 5.11) as part of the systematic analysis of transformations across the various domains in the regions over the past century. In Lough Foyle, these were: The Partition of Ireland and the subsequent failure to delimit the maritime boundaries in the transboundary loughs; the establishment of the Foyle Fisheries Commission; the legacy of the Troubles and the subsequent establishment of the Loughs Agency under the GFA; and most recently the UK's decision to withdraw from the EU. From a Palk Bay context, the following key flashpoints emerged: Independence from British rule; the establishment of the IMBL, the Blue Revolution co-financed by Norway, the end of the civil war in Sri Lanka; and the increase in Sri Lankan naval intervention and regime changes for combatting the IUU fishing.

Perspectives on the contested IMBL in Palk Bay and the potential delimitation of one in Lough Foyle reported by the key informants confirm that for some, borders are

perceived as ‘troublemakers’ and a legacy of a past dominant discourse (Agnew, 2008). From the perspective of Tamil Nadu, the delimitation of the Palk Bay border (although formally agreed by both India and Sri Lanka), has denied ‘the liberty of access to others’ (Van Houtum, 2005: 678). Sri Lankan fishermen are perceived as the ‘winners’ and Tamil Nadu as the ‘losers’ inherent in all border making as argued by Van Houtum and Berg (2018). Conversely, the substantial trawler fleet conducting IUU fishing in another jurisdiction’s waters where trawlers are banned and the oyster farmers harvesting unregulated produce without licenses are also perceived as troublemakers.

When evaluated against Hensel et al.’s (2008) six indicators that drive the salience of a maritime claim, four are applicable to this research (i) maritime borders extending from homeland rather than colonial or dependent territory (Lough Foyle); (ii) a strategic location of the claimed maritime zone (Lough Foyle and Palk Bay), (iii) fishing resources within the maritime zone (Lough Foyle and Palk Bay; (iv) migratory fishing stocks crossing into and out of the maritime zone (Palk Bay). The remaining two have no relevance in these contexts; (v) suspected presence of oil resources within the maritime zone (although it was indicated in an interview that the presence of oil in Lough Foyle would expedite a resolution on the ownership dispute) and (vi) relation of the maritime claim to an ongoing territorial claim (prior to the signing of the GFA, this was relevant, however the Irish Government waived the Constitutional claim to Northern Ireland and the territorial waters in 1998).

Likewise, when evaluated against Guo’s (2018) analytical framework for complex boundary disputes in border regions. A range of interconnected factors influencing cross-border tensions and intensifying ownership and boundary disputes were identified in the case studies; resource scarcity (Palk Bay); locational feature (Lough Foyle and Palk Bay); domestic politics (Lough Foyle and Palk Bay); geopolitical competition (Lough Foyle and Palk Bay); and cultural difference (Palk Bay- Tamil Nadu and Sri Lanka’s Northern Province share a common language but both countries official national languages are different; and possibly Lough Foyle if framed from a religious perspective). Based on the result from the case studies, ‘a history of

colonialism' could be an additional criterion added to this list of factors as it is particularly pertinent in these contexts.

Notwithstanding the past geopolitical influences, geopolitical realities and issues of power continue to be an everyday reality in both regions. In the case of Palk Bay, geopolitics and political relations was a common theme in the interviews with key informants. Geopolitics and issues of power are symbiotic. Whilst the scale of the intrusions by Tamil Nadu trawlers was considered unprecedented in IUU terms, the location of the conflict influenced the urgency, or lack of, to address the problem. It was suggested in the interviews if this scenario had occurred between Indian trawlers in Pakistan's jurisdiction, this conflict would have followed a vastly different trajectory and is unlikely to have lasted very long. This assumption relates to asymmetrical power relations between India and Sri Lanka and the continued violence in the Kashmir region, since the partition of India in 1947, associated with the long-standing territorial dispute between Pakistan and India.

The UK's formal exit from the EU following the end of the Transition Period at the end of 2020 will have far-reaching and unexpected geopolitical consequences for the island of Ireland and Europe. In parallel to the long historical links stated previously, Ireland and the UK have also both been members of the EU since 1973. Brexit signifies an unprecedented and inevitable geopolitical divergence in their trajectories. The final terms of the UK's future relationship with the EU is still uncertain and this ambiguity was a source of tension for many of the key informants in the Lough Foyle case study. It is unclear at this stage what the future will look like for existing governance arrangements in Lough Foyle. There were diverse perspectives on the likely impacts Brexit may have on the ownership dispute ranging from; no likely change at all, to there now being an imperative to agree on a boundary because Lough Foyle will soon become a frontier between an EU and a non-EU territory. With so many unknowns at this time, the level of geopolitical uncertainty adds even more challenges to the complexity of resolving resource conflict in the contested waters of Lough Foyle.

6.2.3 The outcomes of the resource conflict analyses

Both case studies highlight resource conflicts that embody critical challenges for marine ecosystems and livelihood sustainability. Between 1990 and 2018, there was a 122% increase in total fish consumption globally (Haward, 2020). Whilst the demand for seafood protein continues to increase in conjunction with exponential population growth, a third of all global fish stocks are over-fished (FAO, 2020a). The current and potential future effects of climate change and sea level rise have major implications for marine biodiversity (Pecl et al., 2017; Poloczanska et al., 2013; Doney et al., 2012). In light of these cumulative environmental issues, resource conflicts, such as those highlighted in this thesis, may further exacerbate the ability of marine ecosystems to function effectively. It is important to note the distinct differences between the case studies. Lough Foyle involves local Donegal (ROI) stakeholders exploiting marine resources on the western shores (ROI) of the marine ecosystem. In contrast, the Palk Bay conflict involves a trawler fleet from India exploiting a shared marine resource by transgressing an IMBL into another jurisdiction (Sri Lanka).

Conflict resolution must be approached with an awareness of the description within which the conflict is embedded (Kriesberg, 2001). Applying a process of multi-perspective framing allowed for a comprehensive understanding of the case study context. In addition, looking to the past to establish the unique context within which the conflicts have unfolded has been crucial to understanding the status quo in both regions. As discussed in Section 6.2.3, Trajectory of Change Timelines were used as tools to systematic synthesis and analyse the linkages between external geopolitical transformations, the multi-scalar governance interactions and the limited progress made to-date towards a genuine resolution for the resource conflicts.

When evaluated against Yasmi et al.'s (2006) continuum of conflict escalation in natural resource management (Table 2.3), both Lough Foyle and Palk Bay have received national and international media attentions (stage 8). Palk Bay has progressed through all stages from one to eight, whereas the scale of the problem in Lough Foyle is smaller and less intense in comparison. Lough Foyle has not

experienced restrictions imposed by other stakeholders to access the resource (stage five), however, one legal cases against the Loughs Agency involving an alleged native oyster fishing to-date has reached the High Court in ROI (stage six). There has been escalation to physical violence (stage seven). The oyster conflict in Lough Foyle gained international publicity as an indirect result of Brexit which revived debates surrounding the unresolved ownership dispute (stage eight).

In terms of conflict framing[32], following Hisschemöller and Hoppe (2001; 1995), both case studies can be classed as an 'untamed political problem' where conflict exists because stakeholders frame the problem from different perspectives. Technical solutions are available, but their application or enforcement has already or will ultimately be met with intense political and societal conflict and blocked by stakeholders. The IUU dimension of the resource conflicts exacerbates the gravity of the governance challenges and is discussed further in Section 7.5.

6.3 Core findings

Based on a synthesis of the results from the inter-disciplinary review, the case studies and the comparative case study analysis, this section evaluates the overall findings within the context of the theoretical frameworks underpinning this study, their existing bodies of literature, the research objectives and the research questions.

Six core findings have been identified and are discussed in detail below: (i) the footprint of the past: the legacy of colonialism and arbitrarily drawn boundaries; (ii) coastal border regions: the paradox of spatial proximity to neighbouring states and peripherality from the seats of political power; (iii) strategy or apathy: the consequences of political inaction; (iv) contested marine ecosystems and the limitations of LOSC and existing theories of environmental governance; (v) the challenge of moving towards integrated ecosystem-based governance and beyond traditional approaches based on political boundaries; (vi) incorporating multiple-

[32] Conflict framing is discussed in further detail in Section 6.3.2.

perspectives to develop frame-breaking insights and solutions for resource conflicts in contested marine ecosystems.

Section 6.3.1 addresses the first research sub-question: *what are the prominent contextual factors and uncertainties that drive resource conflict in contested regions?* Section 6.3.2 addresses the second research sub-question: *how can we move beyond a reductionist approach of thinking of these areas in terms of lines on maps and towards ecosystem-based approaches?*

6.3.1 What are the prominent contextual factors and uncertainties that drive resource conflict in contested regions?

Geopolitics and Maritime Boundaries

i. The footprint of the past: The legacy of colonialism and arbitrarily drawn boundaries

Whilst many terrestrial boundaries are remnants of colonisation, maritime boundaries are a relatively modern creation and for the most part have materialised following independence and as result of developments under UNCLOS (Østhagen; 2020; 2019; Ásgeirsdóttir, 2016). However, the case studies exemplify long-standing conflicting ownership claims that can be traced back to boundary delimitation ambiguities originating from colonial times. This supports Paasi (2005) who argued that many political boundaries and disputed relating to boundaries are products of a particular form of colonialism.

Prior to, and during the era of colonialism on the island of Ireland, maritime boundary issues were irrelevant in Lough Foyle. During these times, the ecosystem was governed by one jurisdiction (i.e. Ireland and then the UK). The demise of British colonial rule for part of the island of Ireland and the geography of the Partition settlement reflected many ambiguities in terms of terrestrial and maritime boundaries. The arbitrarily drawn terrestrial boundaries reinforced asymmetrical power relations between the British Imperial State, its Ulster Unionist supporters and the Irish nationalists that contested it. The Government of Ireland Act 1920 stated that Northern Ireland would consist of six parliamentary counties. However, this Act

failed to specify the territorial waters but as the island was to remain part of the UK, it did not warrant huge attention at the time. This ambiguity took on greater meaning when the Irish Free State was established and almost a century after independence, there is still no clarity on the boundary line.

In the case of Palk Bay, the first attempt by the colonial powers (in 1921) to establish a 'Fisheries Line' demarcating the waters between India and Sri Lanka was met with resistance. Nevertheless, following the demise of the Empire and subsequently, over five decades later, the 1974 IMBL agreement was broadly based on a modified version of the boundary line proposed first proposed during colonialism. Whilst the boundary line has always been accepted by the central Indian Government, its location and legitimacy has been contested by the Tamil Nadu Government up to the present time. This political ambiguity from different levels of Government was apparent in the results from the media content analysis and the interviews with key informants. Fractured domestic politics linked to diverging perspectives on maritime territory sovereignty within India thus adds a further layer of complexity to the Palk Bay issue.

ii. Coastal border regions: The paradox of spatial proximity to neighbouring states and peripherality from the seats of political power

Lough Foyle is located on the north-west corner of the island of Ireland and the ecosystem separates the two jurisdictions by just 1.6km to 16 km at different points. Typically, the maritime boundary negotiations occur between the Irish and UK Governments in Dublin or London, a distance of over 200km and 600km, respectively. Palk Bay is located on the south-east and north-west fringes of India and the island of Sri Lanka. At its narrowest point, the countries are separated by 30km. The bilateral discussions in relation to the fisheries conflict in Palk Bay that happen through the fisheries Joint Working Group take place in Colombo (300km away) and New Delhi (2000km away). It is likely that these unique geographical and political features have simultaneously enabled the conditions for the resource conflict to

emerge and constrained the promptness of Government responses to address these issues.

Findings from the literature review highlighted that border regions are distinctive due to their geographical and peripheral aspects Guo (2018). They embody geographies at the margins (Cons and Sanyal, 2013) and symbolize geographical and political peripheries located far from their respective political units and heartlands (Guo, 2018; Wilson and Donnan, 2012). A novel insight that emerged from the research was that both study sites exhibit features of spatial proximity to their neighbouring countries, and in parallel, are geographical and political peripheries to their state capitals. The seats of power for all four countries are far removed from the sites of conflict. In addition, the case studies typify resource conflicts that occur on or close to the coastline. For this reason, the scale of the unregulated trestles in Lough Foyle and the fleet of illegal trawlers in Palk Bay is more pronounced for local coastal population when compared to conflicts that occur in offshore regions.

Environmental Governance

iii. Strategy or apathy: The consequences of political inaction

The case studies support previous studies that levels of political interest and political will in transboundary environmental matters are shaped by the current political state of the individual countries involved as well as the existing geopolitical relations in the wider region (Smidt et al. 2014; Ratner et al., 2013; Waisová, 2013; Martin et al., 2011). Political inaction has been a critical feature in the case studies. Political inaction refers to a Government's unwillingness (whether explicit and observable or perceived) to actively intervene in addressing a particular problem (McConnell and Hart, 2019). The findings indicate that resource conflicts linked to contested maritime boundaries seem to be considered secondary to other Government priorities. Early on in the research, it was unclear if this inaction was a form of indifference or apathy on the part of Governments or a deliberate ploy to procrastinate or delay the negotiations indefinitely for different reasons.

In the case of Lough Foyle, the 'do nothing' strategy by the Irish Government was perceived by some key informants as a strategic move not to pursue a course of action (e.g. insist on the median line as the IMBL or take action against the oyster farmers for their unlicensed activities within an SPA) due to the potential fall-out and possible adverse reactions by residents in both jurisdictions. It is unclear at this stage whether this is a deliberative choice to act only when the conditions are optimal (e.g. when the UK comes to an end of the Brexit Transition Period). Alternatively, the Government may have already concluded that pursuing this matter simply is not worth the risk of re-opening old wounds with another territorial battle on the island of Ireland.

In the case of Palk Bay, the asymmetry in terms geopolitical power relationships is stark. As a small island nation, Sri Lanka is heavily dependent on its nearest neighbour, India a regional super-power. In the past decade, India has become Sri Lanka's largest trading partner as well as a main source of foreign direct investment which has been crucial following three decades of the ethnic civil war. For India, Sri Lanka was the largest export market in the South Asian region in 2014 (Jayaratne and Wijayasiri, 2020). Within this broader economic context, escalating the Palk Bay conflict through international attention (e.g. through the IUU fishing frame with the EU, a major importer of Indian fish) may be viewed by the Sri Lankan Government as a high-risk strategy not worth pursuing. Whilst this may be economically and geopolitical advantageous, it may however, be detrimental to the Palk Bay ecosystem that could potentially have already surpassed its ecological tipping point.

iv. Contested marine ecosystems and the limitations of LOSC provisions and existing theories of environmental governance

The literature review confirmed that contested ecosystems are a very real international issue with over half of all maritime boundaries across the globe remaining disputed (refer to section 2.3.1 -2.3.3). In terms of delimitation of maritime zones between states with opposite or adjacent coasts, LOSC provisions under Articles 74 and 83 deal with the EEZ and the continental shelf respectively.

Both of these Articles stress that in order to achieve an equitable solution, delimitation 'shall be effected by agreement on the basis of international law, as referred to in Article 38 of the Statute of the International Court of Justice' which entails the peaceful settlement of disputes and if necessary, compulsory procedures entailing binding decisions. However, international legislation does not provide a practical pathway or specific solution to assist states in their effort to settle maritime disputes specifically in territorial seas, such as those presented in the Lough Foyle and Palk Bay case study. Instead, it merely stipulates that the division should be equitable. In practice, many states apply the median line approach (at equal distance from both coastal states) to resolve disputes in this maritime zone.

However, this approach can be problematic as evidenced in both case studies. In Lough Foyle, due to the location of the navigation channel which runs contiguous to Donegal coast (ROI), the application of a median line to resolve the ownership dispute would effectively cut off British access to Foyle Port (NI) and vessels would have to transit through Irish waters to enter port (Section 4.1.1). In Palk Bay, although an official international maritime boundary agreement is in place since 1974, the delimitation is based on a modified equidistance line whereby the line runs one nautical mile west of the contentious island of Kachchathivu (Section 5.2.1) ceding it to Sri Lanka. To this day, this agreement has been perceived as unjust and inequitable by the Government of Tamil Nadu (but not the central Indian Government). Accordingly, the retrieval of the island of Kachchathivu and restoring fishing rights through the re-drawing of the IMBL in the territorial seas remains a priority for the Government of Tamil Nadu and the Tamil Nadu trawler fleet.

An additional limitation of LOSC that has featured in this thesis is the weakness of enforcement and lack of sanctions to deal with signatories that disregard its provisions. For example, India's Flag State obligations under Article 94 to 'effectively exercise its jurisdiction and control in administrative, technical, and social matters over ships flying its flag' in Palk Bay are clearly being overlooked. Indeed, evidence from the case studies have demonstrated how both the Indian and Irish

Governments are also disregarding their agreed obligations under the UN's Code of Conduct on Responsible Fisheries which is based on LOSC and sets out standards applicable to the conservation, management and development of fisheries and aquaculture.

Palk Bay typifies how the neighbouring states have failed to comply with its obligations to in accordance with Article 192 to 'protect and preserve the marine environment' through the lack of action of the Indian (and Tamil Nadu) Government and the ineffective actions of the Sri Lankan Government to conclusively halt IUU fishing activities by Tamil Nadu trawlers in Sri Lankan waters. Similarly, Lough Foyle demonstrates how the Irish Government has failed to comply with its obligations under Article 192 by resolving the expansion of unregulated and unlicensed oyster trestles, particularly those within in a designated SPA (in addition to its obligations under a host of other EU Directives as discussed in Section 4.2.3).

The obligation to protect the marine environment (solely) by preventing, reducing and controlling pollution under Article 194 are explicitly relevant within the context of the damaging effects associated with the scale of both the trawler fleet and the swathe of trestles. Notwithstanding the importance of managing pollution, its overt focus in the 1982 Convention[33] (and which is now arguably of its time in this regard), may not be capable of fully addressing multiple new pressure sources on the marine environment. Some examples of these more recent pressures include, climate change and ocean acidification; declining ecosystem integrity due to decades of overfishing; damage to sea floor habitats due to the growth in maritime activities; spread of non-indigenous species; underwater noise (Reker et al., 2014)

Linked to these increasing pressures, despite an extensive body of environmental governance literature, there is no blueprint for transitioning from good principle to effective governance in practice in transboundary marine ecosystems. The literature review clarified that on a theoretical level, principles can serve as ideological

[33] For example: Articles 194; 204; 207; 208; 209; 210; 211; 221; 222 etc.

guidelines or codes of conducts for applying governance approaches. The various good practice principles reviewed as part of chapter two; good governance (section 2.5.1.1), common pool resource governance (Table 2.6), EA (Table 2.8), and MEBM (Table 2.9) seem to be more applicable to marine ecosystems that fall solely within one jurisdiction or possibly for transboundary regions characterised by amicable geopolitical relations. Ostrom's (1990) theory of collective action for common pool resource governance was the only set of principles that spelt out the need for institutional arrangements to develop and maintain cost-effective mechanisms to resolve conflicts between resource users. However, when the findings of the case studies were evaluated against these principles, its applicability was limited as they were not designed to deal with geopolitically charged contested ecosystems.

Through the lens of interactive governance theory, existing studies have argued that resource conflicts (i.e. fisheries) cannot be analysed in isolation from the dynamics of the wider ecosystem or the socio-political governance systems in which they are embedded within (Jentoft et al., 2007.) It pre-supposes that solutions for all governance problems can be identified through the analysis of the interactions between these systems (i.e. a governability assessment). Whilst the theory of interactive governance provided a useful starting point, this thesis demonstrates that this claim is not necessarily valid. In order to develop insights for tackling resource conflicts in contested ecosystems, the evaluation of the socio-ecological system to be governed and the existing governance systems had to be supplemented by gathering additional primary and secondary data. This consisted of the systematic (i) historical analysis of the resource conflict, geopolitical analysis of the ownership or boundary dispute, and (iii) interviews with key informants to gain multi-perspective insights to help governance systems to adapt to address the resource conflicts in these settings.

On a general level, results from the inter-disciplinary literature review confirm that transboundary environmental governance in contested ecosystems is thus far an under-studied topic; this thesis addresses the literature gap. Additionally, findings from the case provide evidence that resource conflicts in contested ecosystems pose

insights to a level of complexity, in real-world scenarios, that fail to fit into neat conceptual or theoretical best practice frameworks. Theories of environmental governance need to recognise that contested ecosystems need a tailored approach to take into account their specific contextual factors that differentiate them from non- contested ecosystems.

6.3.2 How can we move towards ecosystem-based approaches and away from reductionist thinking of these areas in terms of lines on maps?

v. The challenge of moving towards integrated ecosystem-based governance and beyond traditional approaches based on political boundaries

This section specifically addresses one of the primary aims of this study: to explore whether agreed maritime boundaries are essential, or whether resource conflicts can be successfully managed through informal or formal arrangements for resource sharing regimes in contested marine ecosystems.

The field of border studies argues that the global preoccupation with boundary delimitation compels us to think about the world and behave in territorial terms. As evidenced in the case studies, borders are social constructions that are inherently problematic (Agnew, 2008) and emphasise a more exclusive sense of *us* and *ours* versus *not-us* and *yours* (Feuer, 2016). From a theoretical border perspective, the findings of this thesis resonate with the work of Wallman (1978) and Van Houtum (2005) reviewed in chapter two. Their studies (which were incorporated into the interview schedule) questioned the contemporary relevance and effectiveness of political boundaries, asking what is its status in historical or situational time? And for whom is it an asset, for whom a liability? Based on these concepts, there is an inevitable price to pay for continuing to enforce or pursue border regimes (Van Houtum and Berg 2018) and there will always be winners and losers. Similar questions were posed to the key informants during the interviews. The answers provided valuable insights from multiple perspectives which ultimately fed into the insights for future governance options specific to the case studies and the overall

implications for conceptual and theoretical development as well as policy issues presented in the concluding chapter.

Contested regions thus require a radical shift in perspective from *them* and *us* to a focus on *our* shared responsibilities, benefits and costs. It is acknowledged that there are risks associated with sharing responsibilities, as in no one state is accountable. However, a potential avenue to mitigate this risk is through a formal binding bilateral agreement that would clarify the specific roles and responsibilities of both governments.

This study has demonstrated that insufficient attention has been afforded to the historical context and geopolitical processes which underpin the construction of contested maritime borders and the resource conflicts that emerge as a result of protracted ambiguity. The diversity of stakeholders and scale of complexity inherent in these distinctive settings therefore calls for a contextualised integrated ecosystem-based governance approach. This could include enhanced opportunities for stakeholder participation such as stakeholder mechanisms that involve all marine users (industry) and not just specific sectors in conjunction with the research community, civil society including NGOs and representatives from statutory agencies and different levels of government from both jurisdictions.

Although many scholars have argued that the core principles of the environmental governance and MEBM can be operationalised through MSP (e.g. Ehler et al., 2019; Santos et al., 2019; Ansong et al., 2017). Evidence from the case studies indicates that not all conflicts in the marine sphere are related to spatial use, some are a matter of poor management and lack of enforcement. Transboundary issues highlighted in Lough Foyle and Palk Bay, unlike those presented by the existing body of transboundary marine governance (i.e. MSP) literature (e.g. Jay et al., 2016; Almodovar et al., 2016; Backer, 2011) do not focus on conflicts involving stakeholders competing for the same space but rather how in-action by one state in response to illegal or unregulated maritime activities can affect the other state as well as the environmental status of the shared (but contested) ecosystem.

As highlighted in chapter two, theories of integrated ecosystem-based governance acknowledge that human and ecological well-being are symbiotic. Ecosystem sustainability is contingent on achieving these two components as one unit (Soma et al., 2015). From a theoretical perspective, transboundary marine governance embodies the key principles of good governance. Additionally, it pre-supposes a high level of cooperation by neighbouring Governments to implement integrated (i.e. joint) management strategies that cross political and sectoral divisions and reflect the diverse interests and values of multiple sectors from both jurisdictions (Tallis et al., 2010).

The findings illustrate how bilateral cooperation at an ecosystem scale is even more challenging when a boundary is contested. Notwithstanding the diverging perspectives on territorial claims, in order to ensure the long-term viability of the shared ecosystems, it is incumbent on the neighbouring jurisdictions of Lough Foyle and Palk Bay to cooperate. IUU fishing activities and unregulated aquaculture linked to the unresolved boundary issues can further exacerbate the challenges for Governments as well as having substantial adverse effects on the marine ecosystems. These findings are consistent with previous research from the field of water management; neighbouring countries tend to cooperate only when the net benefits are perceived to be greater than the net benefits of non-cooperation (Grey et al., 2009; Sadoff and Grey; 2005; 2002). In addition, they support Molina and Liu's (2019) assertion that when the economic benefits of transboundary resources are enjoyed by one jurisdiction, the environmental costs are shared collectively.

The reluctance by all four Governments analysed in this study to shift beyond their fixed territorial perspectives is incompatible with the principles of ecosystem-based governance. Ecosystem and integrated area-based approaches require innovative thinking to transcend the barriers inherent with political boundaries (regardless of whether they are formally agreed or contested). Contingent on this radical shift in mind-set and political priorities, based on Lim's (2016b; 2014b) good practice guidelines (presented in chapter two), we can only *move towards ecosystem-based approaches and away from reductionist thinking of these areas in terms of lines on*

maps, subject to the achieving the following criteria for effect transboundary governance*:* (i) the involvement of stakeholders at each political level; (ii) the existence of political buy-in; (iii) equitable distribution of costs and benefits; (iv) an integrated approach that incorporates clear objectives and best-available science is applied; (v) good environmental governance is practised; (vi) adaptive management (including a system for monitoring and evaluation) is practised; (vii) existence of rules and legal instruments that enable the process; (viii) designated institutions at the appropriate scales with vertical and horizontal linkages are established; (ix) long-term funding and adequate resources are secured; (x) a dispute resolution mechanism exists.

At present, it is clear that neither Lough Foyle nor Palk Bay fulfil these legal, political, social, governance and environmental management criteria. However, these complex set of conditions are a useful starting point to help inform an incremental transition from reductionist thinking of lines on maps towards more integrated ecosystem-based governance approaches.

Conflict Analysis and Resolution

vi. Incorporating multiple-perspectives to develop frame-breaking insights and solutions for resource conflicts in contested marine ecosystems

Due to the complexity of the resource conflicts investigated in this thesis and their deep linkages with transboundary marine resources and contested boundaries, it was imperative to address the topic from multiple perspectives. Based on Coleman (2006), multiple frames across a number of academic disciplines (geography, border studies, geopolitics, conflict analysis and resolution, environmental governance) and sources of data (i.e. peer-reviewed and grey literature, media articles and key informants) were applied to generate a holistic understanding of intractable conflicts in both case studies. This was based on the premise that investigating a topic from diverse perspectives and recognising connections between these frames compels us to reflect on our assumptions and biases and potentially facilitates the identification of alternative pathways previously not considered (Morgan, 1997).

Trajectory of Change Timeline

A multi-perspective baseline of primary and secondary data was collected for each case study through a range of methods. The information was synthesised and presented into two Trajectory of Change Timelines (Figure 4.18, Figure 5.11). This method was a modification of Olsen et al.'s (2009) timeline mapping approach to track ecosystem change and governance responses by placing current issues in their historical context. This was used as a tool to identify how historical and external factors have influenced the current resource conflicts in Lough Foyle and Palk Bay. The timelines offer a panorama of the outcomes of systematic analyses of the key milestones and parallel changes across both jurisdictions from the perspectives of government, industry, the research community, and civil society.

Media- framing

The capacity of the media to influence public discourse and perceptions has been widely reported (Wettstein et al., 2018; Schmidt et al., 2013; Macnamara, 2005; Scheufele, 1999). As part of the multi-perspective approach applied, media framing of the resource conflicts was thus deemed an important viewpoint to incorporate into the overall analytical framework. Results from the case studies identified that over a 14-year period, 193 articles were published reporting on conflict in Lough Foyle whereas 810 articles focused on the Palk Bay fisheries conflict over a nine-year period. It is likely that this discrepancy in the number of articles can be attributed to the perceived scale of the issue and the intensity of the conflict. Evidence from the case studies supports the contention that media framings tend to concentrate on controversial subjects to ensure a more attention-grabbing story (Hansen, 2011). For example, the results of the media content analysis for Palk Bay indicate that between 2009 and 2018, there were allegedly approximately 3000 arrests, 800 boat detainments 2016, over 300 injuries and 85 deaths related to shootings by the Sri Lanka navy. However, it is important to contextualise these figures as 61% of the articles identified were from India media sources. When evaluated against Entman's (1991) criteria (presented in chapter 3), many of these articles were sensationalised and over-simplified with key elements (such as the IUU element) excluded from the coverage.

Conversely, the media content analysis also proved to be a valuable tool to identify key informants to include in the case studies. Following the results of Brexit referendum (2016) and the broadcast of a special current affairs documentary (2017) on the disputed ownership of Lough Foyle, 45% of the total articles identified in the Lough Foyle media content analysis were published. Due to the dearth of literature available on the disputed maritime boundary and the oyster conflict, the media was a gatekeeper to information on certain aspects of the conflict that were either absent or unattainable elsewhere (e.g. specific locations of the oyster farms, names of local stakeholders and stakeholder groups representing industry, eNGOs and civil society etc.)

Problem framing and re-framing

Whilst the resource conflicts presented in the case studies share some characteristics of wicked problems as defined by Rittel and Webber (1973), based on the outcomes of the multi-perspective case study analyses, they were both re-framed as structured or untamed political problems (Hisschemöller and Hoppe's, 2001; 1995). Some studies were identified in the literature that framed similar resource conflicts as wicked (e.g. Groeneveld, 2020; Jentoft and Chuenpagadee, 2009). However, unlike wicked problems where no immediate test of a solution is available (Balint et al., 2011), this study finds that the proliferation of unregulated oyster trestles in Lough Foyle and IUU fishing in Palk Bay have a 'stopping rule'. If these activities were stopped, this could be measured and monitored by the absence of trestles and the cessation of trawler activity in Sri Lankan waters.

Wicked problems are also characterised by their far-reaching impacts, high economic, political and environmental) stakes and urgency (Funtowicz and Ravetz, 1993). In contrast, the Lough Foyle oyster conflict embodies a local issue with low stakes in terms of national economics and the political inaction to-date by the Irish and UK Government suggests there is little urgency to tackle the issue. The case of Palk Bay is somewhat more ambiguous for the neighbouring states. There are arguably high stakes and far-reaching impacts for Sri Lanka in terms of the long term economic and environmental impacts of a fleet of 1500- 2500 vessels trawling in their

jurisdiction three days every week for over 30 years. On the other hand, from an Indian perspective, there are low political stakes and little urgency to curb this IUU activity as evidenced by their lack of decisive political action to-date in respecting Sri Lankan's sovereignty. In addition, the economic implications for the trawler sector and the coastal communities ceasing their operations rapidly are considerably high. Through the lens of untamed political problems (Hisschemöller and Hoppe's, 2001; 1995), resource conflict prevails in Lough Foyle and Palk Bay because stakeholders representing the different governance domains frame the problems and their root causes from different perspectives. In contrast to wicked problems, viable technical solutions are available and well described in both case studies. Due to a combination of economic and geopolitical factors specific to each region, their application will be (or has already been) controversial and has been (or will ultimately be) met with intense opposition and societal conflict by the stakeholders most affected by Government decisions.

In Lough Foyle, technical solutions exist for the oyster conflict and the disputed boundary. The implementation of a transboundary regulatory and management scheme for aquaculture was initially planned to be introduced in 2007. According to data collated as part of this study, this scheme has not progressed due to the jurisdictional issues associated with the conflicting claims of the UK and Irish Government. Evidence from the interviews indicates that the Loughs Agency believe that its establishment would empower them to tackle the unregulated and unlicensed oyster trestles without influencing either jurisdiction's boundary claims. However, this raises the question that if such a scheme will not affect the respective boundary claims, why hasn't the relevant legislation (that was previously drafted over a decade ago) been commenced? Secondly, although not ideal, a technical solution also exists for the ownership dispute in the form of a median line. Due to the unique physical geography of Lough Foyle, all of its marine resources and the navigation channel are located close to the Donegal coastline on the western shore. If this technical solution was to be agreed, it would inevitable create geo-strategic access issues for UK vessels. It would also most likely incite issues related to legacy

of geopolitical sensitives linked to a long history of contested sovereignty on the island of Ireland.

In Palk Bay, the reluctance of the trawler sector to stop transgressing the Sri Lankan IMBL and conducting IUU fishing is inherently linked to a range of important factors highlighted in the case studies. From an economic perspective, this includes group inertia by the Tamil Nadu trawlers through their reluctance to diversify into deep sea fishing beyond Palk Bay despite the illegality of their operations and the central Government offering financial assistance to do so. This finding is directly in line with the phenomenon of reactive devaluation, a cognitive bias that occurs when a conflict resolution proposal is devalued if it originates from an adversary (Ross, 2013). In view of the fact that the central Government refute Tamil Nadu's claim (both the state Government and the trawler sector) that the IMBL with Sri Lanka is illegitimate and they have been ordered to cease IUU fishing, the diversification scheme has been devalued because it was the adversary who had made the offer.

From a geopolitical and historical perspective, Tamil Nadu trawlers (backed by the Tamil Nadu Government) allege that they historically always fished throughout Palk Bay. In reality, the introduction of the technological advances to permit this type of movement only became available since the 1960s. They also argue that the Article 6 of the IMBL negotiated between India and Sri Lanka states free movement of vessels is granted in Palk Bay as before. They interpret this clause to include movement of vessels for the purpose of fishing. However, Sri Lanka refutes this claim because fishing is not explicitly mentioned in the text.

A proposal for an integrated transboundary mechanism in Palk Bay is a tool for re-framing the contested ecosystem in such a way that multi-stakeholder cooperation by all governance domains on both sides of the IMBL is promoted. Alternatively, re-framing the trawler conflict in terms of IUU fishing and Sri Lanka pursuing this avenue in a legal context on an international scale could create political leverage to compel India to accelerate their response to the incursions by the Tamil Nadu trawlers.

Chapter 7: Conclusion and implications for theory and conceptual development and policy issues

This chapter is a concluding chapter that summarises the key issues identified in the earlier chapters. It also discusses the overall implications for theory, conceptual development and policy issues for improving transboundary governance in contested marine ecosystems. These implications are linked to the over-arching research question which sought to examine: *if, and under what circumstances, can good environmental governance arrangements for transboundary resources be achieved in contested marine ecosystems?* The chapter concludes with a discussion of the transferability and limitations of the study and the implications for future research.

7.1 Summary of the key insights

This thesis has focused on an issue that is central in a world and in an era struggling to deal with complex earth system resource scarcity issues. Limited academic attention has been paid to environmental governance dimensions of contested marine ecosystems. This qualitative, exploratory, inter-disciplinary study addresses this gap in the literature. The preceding chapters have achieved the primary aims: *to better understand contested transboundary marine issues; and to explore whether agreed maritime boundaries are essential, or whether resource conflicts can be successfully managed through informal or formal arrangements for resource sharing regimes in contested marine ecosystems.*

Through the application of the multi-perspective analytical framework (Figure 2.6), the outcomes of the detailed case study analyses from contrasting geographical regions in the Global North and Global South (chapter 4 and 5) were compared in chapter 6. Based on a synthesis of the results from the inter-disciplinary literature review, the case studies and the comparative case study analysis, the following core findings were presented: (i) the footprint of the past: The legacy of colonialism and arbitrarily drawn boundaries; (ii) coastal border regions: the paradox of spatial proximity to neighbouring states and peripherality from the seats of political power; (iii) strategy or apathy: The consequences of political inaction; (iv) the limitations of

LOSC and existing theories of environmental governance; (v) the challenges of moving away from traditional approaches based on administrative boundaries towards integrated ecosystem-based governance; (vi) incorporating multiple-perspectives to develop frame-breaking insights and solutions for resource conflicts in contested marine ecosystems. The overall implications for theory, conceptual development and policy issues for improving transboundary environmental governance in contested marine ecosystems are presented in the next section.

7.2 Implications for theory, conceptual development and policy issues

7.2.1 *Breaking the political deadlock by re- framing the issue*

Investigating the research problem from diverse perspectives and disciplines has facilitated new insights which can contribute to proposals for constructive change (Goffman, 1974). One of the core findings that has emerged from the case studies relates to strategic political inaction by Governments and its implications for environmental governance. It can be argued that political inaction can play a constructive role in managing issues that arise in geopolitically sensitive regions with a recent history of violent conflict, however, this strategy comes at a price to the ecosystem. Despite the adverse impacts on the environment, the findings indicate that resource conflicts linked to contested maritime boundaries seem to be considered secondary to other Government priorities.

Transboundary environmental governance is thus intimately linked to politics, something that is often neglected in the marine domain (as demonstrated by the lack of consideration for geopolitical context in the principles of good environmental governance, the EA and MEBM reviewed in chapter two). In terms of operationalising governance through MEBM, recent literature has reported that the initial outcomes of MSP have not lived up to its promise (Trouillet, 2020; Josse et al., 2019; Tafon, 2019). Despite, it's theoretical conflict management aspirations (discussed in Section 2.5.2.2), its application thus far in 44 diverse cases worldwide appears to be as a strategic sectoral spatial planning tool or strategic planning tool for zoning maritime space, typically brought in to complement existing initiatives (Trouillet, 2020). Its

focus has primarily been on mitigating spatial conflict between different marine activities through co-location and co-existence of different marine users rather than addressing resource conflict associated with contested territory and boundaries. Based on the evidence presented in this thesis, the application of MSP is unlikely to provide adequate solutions in the context of contested marine ecosystems.

Drawing on theories of environmental cooperation and peacebuilding, re-framing the problem by placing ecosystem integrity at the centre of the mutual agreement could potentially facilitate and foster new trust and bilateral cooperation. Based on the findings from the case studies and consistent with previous studies (Grey et al., 2009; Sadoff and Gray 2005; 2002), Governments are more likely to cooperate on environmental matters only if there are economic benefits to be achieved *from* the ecosystem (e.g. increased food production) rather than environmental benefits *to* the ecosystem (e.g. improved water quality, conserved biodiversity).

The outcomes of the multi-perspective analytical analysis of both Lough Foyle and Palk Bay led to their framing as untamed (structured) political problems where conflict exists because stakeholders frame the problem from different perspectives. Technical solutions are available, but their application has already or will ultimately be met with societal conflict and blocked by stakeholders. People are integral part of the system within which the problem occurs and are themselves both involved and responsible (Jentoft and Chuenpagdee, 2009). Resolution is invariably a matter of politics rather than maritime law (Forbes, 2001). Framed in this way, Governments are both the source and the solution to their resource and boundary problems. High-level political commitment is a fundamental requirement for tackling resource conflict linked to long-term maritime disputes. In order to bring this type of stalemate to an end, based on the cases studies, it is incumbent on Governments to acknowledge their role in resource conflicts linked to ownership disputes and adopt one of the following transformative options discussed in the next sections.

7.2.2 *'Agree to agree'* by reaching a bilateral agreement (supported and implemented by both Governments on a mutually acceptable boundary line)

Typically, boundary negotiations occur at a bilateral level and are limited to stakeholders from particular government institutions such as the respective Dept. of Foreign (or External) Affairs. Evidence from the case studies highlights that stakeholders from other governance domains (i.e. industry, research community, civil society) whom are often directly affected by a boundary decision (or indecision) have no opportunity to feed into this negotiation process. Whilst there is no legal requirement to engage with stakeholders, their exclusion is problematic. In accordance with the principles of good governance, should the *agree to agree* option be selected, it is essential that stakeholders are afforded the scope to have their voice heard prior to the official bilateral negotiations. This type of good will on behalf of governments would enhance the transparency of the process and promote inclusiveness and buy-in with boundary transformations.

7.2.3 *'Agree to disagree'* on boundary delimitation but cooperate through a joint development scheme for the management of shared resource (at the scale of the ecosystem that transcends issues of ownership)

It has been argued that seeking outright delimitation is time intensive and can delay a state's ability to exploit its natural resources, (ex-colonial) states whose maritime boundaries are currently contested should 'strongly consider joint development agreements' as a more pragmatic alternative approach (Okafor-Yarwood, 2015). An example of an existing *agree to disagree* treaty is the Bay of Dollart in the Wadden Sea, signed in 1960. A boundary line was defined in 2014 but the border dispute remains unresolved and both The Netherlands and Germany are responsible for the shared ecosystem (presented in Table 2.2).

Selecting the *agree to disagree* option would signify that ownership or the specific location of the boundary might be less important if appropriate mechanisms for

resource sharing can be implemented. A joint development mechanism could help to move beyond the '*them and us'* paradigm which is inherent with all socio-political boundaries. However, as evidenced in Lough Foyle, this type of governance arrangement can only function effectively if the Government's respective fixed positions on territorial claims are genuinely set aside in the interest of conflict resolution and the long-term sustainability of the shared ecosystem.

Should Governments decide the preferred approach is to *agree to disagree but cooperate through* a joint development scheme is imperative that a robust transboundary institutional arrangement is established. Such a mechanism may not be possible at first and in the interim, designated institutions from both jurisdictions could develop a shared vision for the ecosystem and align their activities accordingly. These institutional arrangements need to be based on the principles of good governance, reflect the interests and marine activities of all relevant stakeholders, supported by a joint secretariat and co-funded by both jurisdictions. The overall goal is to develop and implement a single integrated multi-sectoral management framework at the scale of the ecosystem based on a multi-disciplinary scientific evidence base (i.e. humanities and physical sciences).

7.3 Limitations of this research

It is important to emphasise that the selection and number of case studies was constrained by a combination of other factors including access to key informants, data availability, language barriers and financial limitations to travel to additional countries. Whilst it is acknowledged that multiple cases typically lead to more robust outcomes than single-case research, dual in-depth case studies can also be used to either illustrate contrasting or similar results for expected reasons (Yin, 2003) as illustrated in this thesis. As discussed in Section 3.2.1, the specific cases of Lough Foyle and Palk Bay were fieldwork determined and their selection was thus based on a pragmatic approach driven by appropriateness (Kuzel, 1999) of the study sites (i.e. cases of transboundary governance challenges with strategic importance to the phenomenon of inquiry and align with the purpose of the research) combined with an opportunistic purposeful sampling strategy (Shakir, 2002 based on Patton, 1990).

Critical difficulties were encountered for both case studies during the course of the interviewee recruitment stage and the interviews. In terms of key informants from the government domain (21 in total: 16 for Lough Foyle and five for Palk Bay), with the exception of the Irish Government, the majority of those interviewed did not represent the central (national) government (e.g. UK/London, India/New Delhi or Sri Lanka/Colombo central Government)[34]. They represented the devolved administration or local Government in Northern Ireland and the State of Tamil Nadu in India and the Northern Province in Sri Lanka. In addition, two representatives with a cross-border remit in Lough Foyle and one representative from an intergovernmental organisation in the Bay of Bengal were interviewed.

Although the key informants were assured that the data being collected was for research purposes only, was confidential and would not be attributed to individuals, there was a degree of wariness around recording views on the subject matter. For this reason, six potential respondents declined to participate in Lough Foyle; four of these were Government representatives from Northern Ireland that were instructed by their line managers not to contribute to the study. As a result, more ROI interviewees representing government participated in the interviews than those from Northern Ireland.

During the interviews, challenges emerged when some of the more contentious aspects of the resource conflicts were considered (e.g. alleged shooting of fishermen by the Sri Lankan navy; ownership issues of Lough Foyle and border related politics on the island of Ireland). Of those that did chose to participate, not all questions were answered, and some talked around the topics or avoided certain questions altogether. Some interviewees representing government offered their organisation's perspective rather than a personal view on certain issues. In order to continue some interviews, some views were shared on the agreement that they were 'off the record' and therefore had to be excluded from the results section. These were unexpected outcomes that reflect the real-life geopolitics in contested regions and suspicion around the subject of resource conflict and were not anticipated during the research

[34] Refer to Table 3.4 for specific details of each key informant in the case studies.

design stage. Ultimately, this had implications for the thesis findings and the types of future governance options proposed.

Geographical distribution played a major component in the quantity of face-to-face interviews that were possible, particularly in the Palk Bay case study. An additional complication was on arrival in India to begin my field work in December 2015, Tamil Nadu experienced unprecedented rainfall and the worst flooding in over a century resulting in the displacement of over 1.8 million people and the deaths of more than 500. As a result, a number of interviews had to be rescheduled and cancelled at short notice.

In terms of key informant suitability and languages spoken, particular barriers were experienced with Palk Bay, as the sample was based on their professional track record in dealing with the resource conflict and limited to those who spoke English. In India, while the national language is Hindi, the primary language spoken in the state of Tamil Nadu is Tamil, followed by English. In Sri Lanka, Sinhala is the primary language, but Sri Lankan Tamil is the main language spoken in the Northern Province adjacent to Palk Bay. Whilst a local guide was available for part of my fieldwork on the Indian side of Palk Bay, the interview process was primarily limited to those who spoke fluent English. Some of the interviews with those who indicated during the recruitment stage that they spoke English as a second language were especially challenging due to thick accents. On reflection, the use of a translator or interpreter (funds-permitting) would have mediated these barriers in other Palk Bay interviews.

A further issue that potentially impacted this research was positionality. Positionality describes the stance or positioning of the research and the researcher in relation to the socio-political context of the study (Coghlan and Brydon-Miller, 1994). It is 'determined by where one stands in relation to the 'other'' (Merriam et al., 2001: 41) and it is acutely significant when conducting research in the Global South. The researcher's beliefs, political stance and cultural background (e.g. race, gender, socio-economic status, and education) are significant factors that can affect all stages of the research process (Bourke, 2014). The author's own bias had the potential to

shape the research process (e.g. by gravitating to one side of the resource conflict over another or empathising with local populations in northern Sri Lanka due to the number of deaths from the ethic war). The author's positionality may also have influenced the responses of the key informants (e.g. in terms of the disputed ownership of Lough Foyle by Ireland and the UK). As an educated, Caucasian European/Irish 'westerner' female who has grown up in the Global North but has spent a few years working in African countries, it was therefore essential for the author to be cognisant of their positionality and strive to remain as neutral as possible when conducting research in Palk Bay and in Lough Foyle.

7.4 Transferability and recommendations for future research

The multi-perspective interdisciplinary framework designed for this research was successfully trialled in case studies from the Global North and Global South. This framework supports flexible and context specific analysis without being case study specific. It provides a repeatable, transferable approach and robust methodological tool to provide new insights into how governance policies could be transformed to address the complexity associated with contested regions worldwide.

As highlighted earlier, less than half of the 427 potential maritime boundaries have been resolved and many of these only partially (Ásgeirsdóttir and Steinwand 2015; Prescott and Schofield, 2004). Further comparative analyses from the Global North and Global South will be valuable for examining the contextual variables explored in this study and developing a deeper understanding of resource conflicts in contested marine ecosystems worldwide. There is also scope for its transferability to other contexts beyond the marine domain such as in contested terrestrial ecosystems or international river basins.

A key area for future research is the investigation of whether a deeper understanding of power asymmetries linked to historical legacy can be integrated into principles of environmental governance. The research could also potentially be refined through the addition of an economic analysis of the cost of cooperating across boundaries versus the cost of continuing not to cooperate.

7.5 Contribution to the literature

First and foremost, this thesis addresses the research gap identified in Section 2.6. With over half of all maritime boundaries unresolved, limited attention has been paid to these contested marine ecosystems as a distinctive site for the study of the challenges and opportunities for transboundary environmental governance. What is particularly novel in this thesis is the application of social science perspectives, specifically from the fields of geography (i.e. border studies and critical geopolitics) and conflict analysis and resolution, in an effort to develop governance solutions for complex resource conflicts in these contested regions.

The findings from the case studies have revealed that shared ecosystems in regions with a history of recent violent conflict and political instability require special attention. Transboundary environmental governance in these settings is inherently a political process, ultimately determined by the broader historical and geopolitical context, and often subject to apathy or strategy by neighbouring coastal states. Resource conflicts arising from contested marine ecosystems pose insights into a level of complexity and uncertainty in real-world scenarios that fail to align with conventional principles or theoretical best practice frameworks.

This research was based on the premise that the quality of environmental governance outcomes can be improved through systematic and holistic governability assessments of (Chuenpagadee and Jentoft, 2009). Issues and conflict in marine resource management manifest from all three aspects (i.e. contextual variables) of Kooiman et al.'s (2008) interactive (or socio-political) governance model: (i) the socio-ecological system to be governed (e.g. natural and human dimensions), (ii) the governance system (e.g. existing institutions and mechanism to deal with issues) and (ii) the interactions between these two systems (e.g. the flow of information, degree of stakeholder participation). The conceptual framework (or multi-perspective analytical framework) presented in Figure 2.6) was developed following an extensive inter-disciplinary literature review presented in chapter two. In particular, it provides a new conceptual contribution to the field of transboundary environmental

governance that builds on existing interactive governance models. Through its application in two cases studies demonstrated in this thesis, this framework provides a tailored governance lens for examining resource conflict in contested ecosystems through the addition of contextual variables of strategic significance in these settings.

In a departure from previous studies that have applied interactive governance[35], within the socio-ecological system to be governed, the following additional contextual variables were included in the case study analyses; human dimensions: (a) the historical legacy and geopolitical realities related to the wider region and the maritime boundary or ownership dispute (Sections 4.2.1 and 5.2.1); (b) the evolution of the resource conflict (Sections 4.6.2 and 5.6.2); and natural dimensions- the marine biogeography of the region and its links with the resource conflict (Sections 4.2.2 and 5.2.2). Within the governance system, the following contextual variables were included in the in the case study analyses; the existence and capacity of the existing governance institutions and mechanism at different scales: (a) local, (b) national and (c) transboundary (Sections 4.3 and 5.3).

A critical finding emerged in relation to the topic of IUU and the resource conflict in the Lough Foyle case study. EU law excludes oysters and a host of other aquaculture products from its definition of fishery products under the EU's Regulation on IUU[36]. Although the oysters being produced on the ROI coastline are currently unlicensed and unregulated, from a regulatory perspective, they are therefore beyond the scope of existing regulations which raises further issues for governance in the region. In the ongoing absence of a regulated licensing regime, the Lough Foyle oyster farmers could potentially face future trade implications for their unregulated produce.

[35] Such as those presented in Section 2.5.1.3; e.g. capture fisheries and aquaculture (Scholtens, 2016a; 2015; Song et al., 2013; Scholtens and Bavinck, 2013; Chuenpagdee et al. 2008; Bavinck and Salagrama, 2008; Kooiman and Bavinck., 2005; Bavinck et al., 2005), coastal and marine governance (Jentoft and Chuenpagdee, 2009) marine conservation (Chuenpagdee, 2011), marine protected areas (Pascual-Fernández, 2015; De la Cruz Modino, 2013; 2005; Jentoft et al., 2012; 2007).

[36] Council Regulation (EC) No 1005/2008 of 29 September 2008 establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing

From a case study perspective, the Lough Foyle literature review (section 4.4.1) demonstrated that although the terrestrial border has been the subject of numerous publication and particularly recently in relation to the Brexit debates, the border bays of Foyle and Carlingford have for the most part, been excluded from these analyses. Whilst there is a plethora of studies from the natural sciences on various species and habitats in Lough Foyle, there is a dearth of information focusing on the human dimensions of the more recent resource conflicts linked to the ownership dispute. Chapter four addresses this gap and provides novel insights based on empirical data from 46 semi-structured interviews with key informants in terms of the oyster conflict as the current manifestation of the longstanding maritime dispute; (ii) (lack of) political will to resolve the ownership dispute, (iii) the effectiveness of the existing transboundary governance regime and opportunities for multi-stakeholder participation; and (iv) future uncertainties and the potential impacts of Brexit on Lough Foyle. Based on the local and broader geopolitical realities identified in the case study, three empirically-based insights for evidence-based future governance options were formulated: breaking the geopolitical deadlock during the current political climate; proactively engaging with the oyster sector in preparation for a new licensing regime; and a review of existing transboundary governance mechanisms to enhance opportunities for stakeholder participation.

In terms of the existing body of knowledge for Palk Bay, most peer-reviewed literature thus far has been limited to discipline specific studies such as social and economic analyses relating to fisheries governance (e.g. legal pluralism; mechanisation of the fishing industry) or most recently, political and legal analyses (Table 5.7). For the most part, the existing body of literature has overlooked other critical components which are explored in this chapter. Firstly, the IUU context of the conflict has only recently began to receive attention (Kularatne, 2020; Stirrat, 2018; Vasan, 2018), this case study contributes further insights knowledge from this perspective. Secondly, the potential for more integrated, inter-disciplinary environmental governance approaches (that move beyond single-sector approaches) through the application of geopolitically context- specific MEBM has not been explored to-date in the Palk Bay context.

The combined results from the extensive inter-disciplinary literature review, the cases studies and the comparative case study analysis gave rise to a series of core findings (section 6.3) with important implications for policy issues related to transboundary governance in contested marine ecosystems (Section 7.3).

7.6 Concluding remarks

As the potential for conflict over maritime space and marine resources increases, a key message from this research is that contested marine ecosystems need to be put more in the spotlight in environmental governance. However, above all, it cannot be over-stated how important political leadership is in addressing transboundary issues through cooperative approaches with neighbouring jurisdictions. Conceptual or theoretical best practice frameworks for environmental governance are immaterial if Government leaders are not willing to come to the table and agree on pathways to break the political impasse.

Finally, it should be emphasised that global change, geopolitical transformations and climate change necessitates the investigation of new and alternative approaches to the ways we govern natural resources, particularly those shared by two or more jurisdictions. This requires us to explore issues of environmental governance from a holistic lens, one which emphasises the footprint of the past in the present, the multiplicity of and increasing number of stakeholders and future environmental, geopolitical and economic uncertainties.

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Appendix 1

Information Sheet and Consent Form for Research Participants

Thank you for considering participating in this research project. The purpose of this document is to explain to you what the research is about and what your participation would involve, so as to enable you to make an informed choice.

The purpose of this PhD study through UCC's Geography Departments is to better understand transboundary marine issues in contested ecosystems and explore whether agreed maritime boundaries are essential. The study investigates whether resource conflicts in contested marine ecosystems can be successfully managed through informal arrangements or resource sharing regimes. The research approach incorporates two case studies of shared marine ecosystems: Lough Foyle on the island of Ireland; and Palk Bay, separating India and Sri Lanka.

Should you choose to participate, you will be asked to take part in a one-to-one interview. This interview will be audio-recorded and is expected to take 50 -60 minutes to complete.

You have been invited to participate in this study because you can provide insights on the research topic due to your expertise and background. Participation in this study is completely voluntary. There is no obligation to participate, and should you choose to do so you can refuse to answer specific questions or decide to withdraw from the interview. Once the interview has been concluded, you can choose to withdraw your details at any time in the subsequent two weeks.

All of the information you provide will be kept confidential and anonymous at all times. The only exception is where information is disclosed which indicates that there is a serious risk to you or to others. Once the interview is completed, the recording will immediately be transferred to an encrypted laptop and wiped from the recording device. The interview will then be transcribed by the researcher, and all identifying information will be removed. Once this is done, the audio-recording will also be deleted and only the anonymized transcript will remain. This will be stored on the University College Cork OneDrive system and subsequently on the UCC server. The data will be stored for a minimum of 10 years before being destroyed.

The results from the interviews will be presented in the PhD thesis in addition to other results from literature reviews and media analyses.

The information you provide may contribute to research publications and/or conference presentations.

If you have any queries about this research, you can contact me at: s.twomey@ucc.ie

If you agree to take part in this study, please sign the consent form overleaf.

ucc

Coláiste na hOllscoile Corcaigh, Éire
University College Cork, Ireland

Consent Form

I……agree to participate in **Sarah Twomey's** PhD research study.

The purpose and nature of the study has been explained to me in writing.

I am participating voluntarily.

I give permission for my interview with **Sarah Twomey** to be audio-recorded.

I understand that I can withdraw from the study, without repercussions, at any time, whether before it starts or while I am participating.

I understand that I can withdraw permission to use the data within two weeks of the interview, in which case the material will be deleted.

I understand that anonymity will be ensured in the write-up by disguising my identity.

I understand that disguised extracts from my interview may be quoted in the thesis and any subsequent publications if I give permission below:

(Please tick one box:)

I agree to quotation/publication of extracts from my interview ☐

I do not agree to quotation/publication of extracts from my interview ☐

Signed: ……. Date: ……..

PRINT NAME: …….

Appendix 2

Interview Schedule: Lough Foyle and Palk Bay

The purpose of the interview is to gain insights on the case study from multiple perspectives on both sides of the border. The following open-ended exploratory questions are designed to guide the discussions with representatives from government, industry, the research community and civil society:

- Looking to the past: Historical roots of the current issues and the wider context.
- Looking to the present: Current status of the contested boundary and the existing resource conflict.
- Looking to the future: Potential uncertainties that may affect the region and proposals to resolve the issues.

1. Describe the most significant events or developments that you believe have shaped the current situation? (e.g.
2. What are your views on the disputed boundary? In which contexts is it relevant? What is it status in historical or situational time? For whom is it an asset, for whom a liability? What meaning does it have on each side? Do you think the boundary line needs to be agreed?
3. In the past, what sectors have been most affected by the dispute? How were they affected? What was their response?

4. How have government authorities addressed problems in the region? How has this affected activities in the region?
5. What do you perceive is the most contentious issue at present? Who are the main actors involved and how is it perceived by them?
6. What are the key factors driving this current issue (i.e. oyster conflict/ fisheries conflict)?
7. Can you show me the locations you feel are the hotspots for conflict on the map? Have these changed over time?
8. What are the key factors currently driving this issue?
9. How effective are the current transboundary mechanisms (e.g. Loughs Agency in Lough Foyle; Joint Working Group in Palk Bay)? Have you had much interaction with them? What opportunities exist to feed into their decision-making processes? How can the existing transboundary mechanisms be improved?
10. What future uncertainties are likely to influence the region? In what way could they affect the resource conflict/ boundary/ownership dispute?
11. What needs to change to break the political deadlock? How likely is this?
12. What recommendations can you suggest to resolve the conflict?

Supplementary questions:

- Is there anything else we have not discussed that you would like to add?
- Could you recommend other key informants that I should interview on this topic?

- Are there any key publications that you can recommend that are important for this study?

Appendix 3

Maritime boundary delimitation agreements between Sri Lanka and India[37]:
• **Agreement between Sri Lanka and India on the boundary in historic waters between the two countries and related matters:** 26 and 28 June 1974 (entry into force: 10 July 1974).
• **Agreement between Sri Lanka and India on the maritime boundary between the two countries in the Gulf of Mannar and the Bay of Bengal and related matters:** 23 March 1976 (entry into force: 10 May 1976).
• **Supplementary Agreement between Sri Lanka and India on the extension of the maritime boundary between the two countries in the Gulf of Mannar**

[37] The text of these agreements can be accessed online from: https://www.un.org/Depts/los/LEGISLATIONANDTREATIES/STATEFILES/LKA.htm

from position 13 m to the trijunction point between Sri Lanka, India and Maldives (point T): 22 November 1976 (entry into force: 5 February 1977).

Agreement between Sri Lanka and India on the Boundary in Historic Waters between the two Countries and Related Matters 26 and 28 June 1974

The Government of the Republic of Sri Lanka and the Government of the Republic of India,

Desiring to determine the boundary line in the historic waters between Sri Lanka and India and to settle the related matters in a manner which is fair and equitable to both sides,

Having examined the entire question from all angles and taken into account the historical and other evidence and legal aspects thereof,

Have agreed as follows:

Article 1

The boundary between Sri Lanka and India in the waters from Palk Strait to Adam's Bridge shall be arcs of Great Circles between the following positions, in the sequence given below, defined by latitude and longitude:

Position 1: 10° 05' North, 80° 03' East
Position 2: 09° 57' North, 79° 35' East
Position 3: 09° 40.15' North, 79° 22.60' East
Position 4: 09° 21.80' North, 79° 30.70' East
Position 5: 09° 13' North, 79° 32' East
Position 6: 09° 06' North, 79° 32' East

Article 2

The co-ordinates of the positions specified in Article 1 are geographical co-ordinates and the straight lines connecting them are indicated in the chart annexed hereto which has been signed by the surveyors authorized by the two Governments, respectively.

Article 3

The actual location of the aforementioned positions at sea and on the sea-bed shall be determined by a method to be mutually agreed upon by the surveyors authorized for the purpose by the two Governments, respectively.

Article 4

Each country shall have sovereignty and exclusive jurisdiction and control over the waters, the islands, the continental shelf and the subsoil thereof, falling on its own side of the aforesaid boundary.

Article 5

Subject to the foregoing, Indian fishermen and pilgrims will enjoy access to visit Kachchativu as hitherto, and will not be required by Sri Lanka to obtain travel documents or visas for these purposes.

Article 6

The vessels of Sri Lanka and India will enjoy in each other's waters such rights as they have traditionally enjoyed therein.

Article 7

If any single geological petroleum or natural gas structure or field, or any single geological structure or field of any other mineral deposit, including sand or gravel, extends across the boundary referred to in Article 1 and the part of such structure or field which is situated on one side of the boundary is exploited, in whole or in part, from the other side of the boundary, the two countries shall seek to reach agreement as to the manner in which the structure or field shall be most effectively exploited and the manner in which the proceeds deriving therefrom shall be apportioned.

Article 8

This Agreement shall be subject to ratification. It shall enter into force on the date of exchange of the instruments of ratification which will take place as soon as possible.

Colombo, 26th June, 1974. New Delhi, 28 June, 1974.

Agreement between Sri Lanka and India on the Maritime Boundary between the two Countries in the Gulf of Mannar and the Bay of Bengal and Related Matters 23 March 1976

The Government of the Republic of Sri Lanka and the Government of the Republic of India,

Recalling that the boundary in the Palk Strait has been settled by the Agreement between the Republic of Sri Lanka and the Republic of India on the Boundary in Historic Waters between the Two Countries and Related Matters, signed on 26/28 June, 1974,

And desiring to extend that boundary by determining the maritime boundary between the two countries in the Gulf of Mannar and the Bay of Bengal,

Have agreed as follows:

Article 1

The maritime bondary between Sri Lanka and India in the Gulf of Mannar shall be arcs of great circles between the following positions, in the sequence given below, defined by latitude and longitude:

Position 1 m:	09° 06'.0 N	79° 32'.0 E
Position 2 m:	09° 00'.0 N	79° 31'.3 E
Position 3 m:	08° 53'.8 N	79° 29'.3 E
Position 4 m:	08° 40'.0 N	79° 18'.2 N
Position 5 m:	08° 37'.2 N	79° 13'.0 E
Position 6 m:	08° 31'.2 N	79° 04'.7 E
Position 7 m:	08° 22'.2 N	78° 55'.4 E
Position 8 m:	08° 12'.2 N	78° 53'.7 E
Position 9 m:	07° 35'.3 N	78° 45'.7 E
Position 10 m:	07° 21'.0 N	78° 38'.8 E
Position 11 m:	06° 30'.8 N	78° 12'.2 E
Position 12 m:	05° 53'.9 N	77° 50'.7 E
Position 13 m:	05° 00'.0 N	77° 10'.6 E

The extension of the boundary beyond position 13 m will be done subsequently.

Article 2

The maritime bondary between Sri Lanka and India in the Bay of Bengal shall be arcs of great circles between the following positions, in the sequence given below, defined by latitude and longitude:

Article 2

The maritime bondary between Sri Lanka and India in the Bay of Bengal shall be arcs of great circles between the following positions, in the sequence given below, defined by latitude and longitude:

Position 1 b:	10° 05'.0 N	80° 03'.0 E
Position 1 ba:	10° 05'.8 N	80° 05'.0 E
Position 1 bb:	10° 08'.4 N	80° 09'.5 E
Position 2 b:	10° 33' 0 N	80° 46'.0 E
Position 3 b:	10° 41'.7 N	81° 02'.5 E
Position 4 b:	11° 02'.7 N	81° 56'.0 E
Position 5 b:	11° 16'.0 N	82° 24'.4 E
Position 6 b:	11° 26'.6 N	83° 22'.0 E

Article 3

The coordinates of the positions specified in Articles I and II are geographical coordinates and the straight lines connecting them are indicated in the chart annexed hereto, which has been signed by the surveyors duly authorised by the two Governments respectively.

Article 4

The actual location at sea and on the sea-bed of the positions specified in Articles I and II shall be determined by a method to be mutually agreed upon by the surveyors authorised for the purpose by the two Governments, respectively.

Article 5

(1) Each Party shall have sovereignty over the historic waters and territorial sea, as well as over the islands, falling on its side of the aforesaid boundary.

(2) Each Party shall have sovereign rights and exclusive jurisdiction over the continental shelf and the exclusive economic zone as well as over their resources, whether living or non-living, falling on its side of the aforesaid boundary.

(3) Each Party shall respect rights of navigation through its territorial sea and exclusive economic zone in accordance with its laws and regulations and the rules of international law.

Article 6

If any single geological petroleum or natural gas structure or field, or any single geological structure or field of any mineral deposit, including sand or gravel, extends across the boundary referred to in Articles I and II and the part of such structure or field which is situated on one side of the boundary is exploited, in whole or in part, from the other side of the boundary, the two countries shall seek to reach agreement as to the manner in which the structure or field shall be most effectively exploited and the manner in which the proceeds deriving therefrom shall be apportioned.

Article 7

The Agreement shall be subject to ratification. It shall enter into force on the date of exchange of instruments of ratification, which shall take place as soon as possible.

New Delhi, 23rd March 1976.

Supplementary Agreement between Sri Lanka and India on the Extension of the Maritime Boundary between the two Countries in the Gulf of Mannar from Position 13 m to the Trijunction Point between Sri Lanka, India and Maldives (Point T) 22 November 1976

The Government of the Republic of Sri Lanka and the Government of the Republic of India,

Recalling the Agreement between Sri Lanka and India on the Maritime Boundary between the two countries in the Gulf of Mannar and the Bay of Bengal and related matters, which was signed in March 1976 (a copy of which is annexed hereto marked Annex I), and which, in Article I, provides that "the extension of the boundary beyond position 13 m will be done subsequently",

Recalling the Agreement between Sri Lanka, India and Maldives concerning the determination of the trijunction point between the three countries in the Gulf of Mannar, which was signed by the representatives of the three Governments in July 1976 (copy of which is annexed hereto marked Annex II),

And desiring to extend the maritime boundary between Sri Lanka and India in the Gulf of Mannar from position 13 m to the trijunction point (point T),

Have agreed as follows:

Article 1

The maritime boundary between Sri Lanka and India in the Gulf of Mannar beyond position 13 m, defined in the Maritime Boundary Agreement of March 1976 (Annex I), up to the trijunction point (point T) defined in the trilateral agreement of July 1976 (Annex II) shall be arcs of great circles between the following positions, defined by latitude and longitude:

Position 13 m: 05° 00'.0 N 77° 10'.6 E

Point T: 04° 47'.04 N 77° 01'.40 E

Article 2

The provisions of Article III to Article VII of the Maritime Boundary Agreement of March 1976 (Annex I) shall apply, mutadis mutandis, to this Agreement, as if this Agreement were supplementary to and an integral part of that Agreement.

Place: Colombo

Date: 22nd November, 1976.